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File Sleeping
Bear Dunes


DEVELOPMENT CONCEPT PLAN/INTERPRETIVE PROSPECTUS
ENVIRONMENTAL ASSESSMENT

NL

Glen Haven Area
Sleeping Bear Dunes National Lakeshore
Michigan

Draft
December 1986

United States Department of the Interior
National Park Service



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INTRODUCTION

BACKGROUND

Overview

The Glen Lake area is a focus for visitor activity in Sleeping Bear Dunes National Lakeshore. Over 70 percent of park visitors come to this general area. Attractions include the Sleeping Bear Dunes, a 5,000-acre complex of active dunes; Little Glen Lake, where a guarded swimming beach is available; the Dune Climb, the most visited area in the park; Stocking Scenic Drive, which offers panoramic views of Lake Michigan, the Sleeping Bear Dunes, and the surrounding countryside; the former Coast Guard (lifesaving) station, which now houses a maritime museum; and Glen Haven, a historic village. (see Vicinity map). The Glen Haven study area is bounded by Glen Arbor on the east, the Sleeping Bear Dunes on the west, Lake Michigan on the north, and the Glen Lake moraine (Alligator Hill) on the south.

Previous Plans and Studies

The General Management Plan (NPS, 1979b) for the lakeshore includes the following proposals for the Glen Haven area:

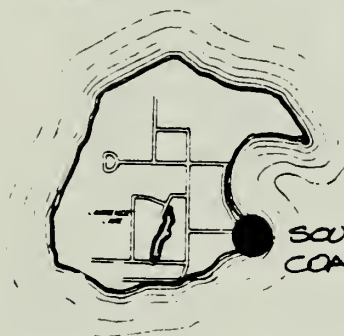
Glen Haven's village atmosphere, its historical significance in the development of the region, and its proximity to major access routes make it ideal for becoming a major tourist attraction. Interpretive themes will cover logging, agriculture, maritime history, and recreational activities. The buildings in the village and the lifesaving station will be adapted for interpretation, food service, craft sales, and management. The village atmosphere will be further enhanced by

NORTH MANITOU
ISLAND



NORTH MANITOU ISLAND
VILLAGE

SOUTH MANITOU
ISLAND



SOUTH MANITOU ISLAND
COAST GUARD STATION

LELAND

PYRAMID POINT

GOOD HARBOR
BAY

SLEEPING BEAR POINT
LIFESAIVING STATION

SLEEPING BEAR POINT

SLEEPING BEAR
BAY

D.H. DAY CAMPGROUND

GLEN HAVEN

GLEN ARBOR

DUNE CLIMB

STOCKING SCENIC DRIVE

EXISTING VISITOR CENTER

NORTH BAR LAKE

GLEN LAKE

SOUTH BAR LAKE

EMPIRE

VICINITY

GLEN HAVEN AREA
SLEEPING BEAR DUNES N.L.

encouraging visitors to tour the site on foot and by not allowing private vehicles in the town during the summer. Road access will be provided to a parking area on the edge of the village. Public transportation between the parking area, the town, the lifesaving station, and the northern tip of Sleeping Bear Dune may be available during the peak season for those who cannot walk or prefer not to. This would also help control use of the lifesaving station and the dune. At other times of the year, visitors will be able to drive their vehicles to the lifesaving station. Access will continue to be provided to private lands in the area.

The existing dune-ride will be eliminated because of visual and physical impacts on the dunes, conflicts with hikers, and the high cost of maintaining the road.

The D. H. Day Campground just east of Glen Haven will be rehabilitated. The capacity of the campground will remain the same, but there will be fewer campsites per acre, improving the visitor experience by increasing the vegetative cover between sites. Access to the beach in this immediate area will be limited to visitors staying at the campground. A group campground for approximately 80 people will also be developed in the area to help accommodate the demand for group facilities. A new 50-site hike-in campground will be developed in the Burnham Woods area.

Sleeping Bear Dunes National Lakeshore does not have parkwide interpretive prospectus (plan). As a supplement to the 1979 General Management Plan, an "interpretive resource base" was prepared (NPS 1979c). It provides detailed recommendations for interpreting the park's resources, including the Glen Haven area.

The 1979 general management plan (GMP) also proposed that a new docking facility for public boat service to the Manitou Islands and launching ramps for private boats be constructed somewhere between Port Oneida and Empire. The site was to be selected through a suitability/feasibility study. The study was begun in 1981, and Glen Haven was one of several sites evaluated (NPS 1984). The study was completed in 1985, and based on extensive technical data and public input, the Park Service decided not to develop a docking facility in the lakeshore.

In 1982 a special history study of Glen Haven Village was undertaken to provide information to assist area interpretation and to provide data to develop a National Register of Historic Places inventory/nomination form. The village was accepted to the National Register as an historic district on June 24, 1983. The history study entitled "D.H. Day's Kingdom" (NPS, 1984) was approved in February 1984.

PURPOSE OF THE DOCUMENT

This development concept plan/interpretive prospectus (DCP/IP) presents the National Park Service proposal for use, development, and interpretation of the Glen Haven area for the next 10 to 15 years. The DCP/IP updates, amends, and expands on the general concept in the 1979 GMP. The DCP/IP presents more specific proposals and establishes priorities and current cost estimates for proposed facility construction and interpretive media. The environmental assessment (EA) portion of the document presents alternatives, impacts, and other considerations for environmental, endangered species, floodplains and wetlands, and cultural resource compliance requirements. An Assessment of Alternatives (NPS 1979a) was prepared for the 1979 GMP to analyze environmental impacts. The current EA therefore concentrates on issues not addressed in the GMP, or where a significant revision is being considered in the DCP.

PLANNING ISSUES

Cultural Resources

The 1979 GMP states that the village atmosphere will be preserved and the buildings in the village and at the lifesaving (Coast Guard) station will be adapted for interpretation, food service, craft sales, and management. The GMP does not specify whether building exteriors and the historic landscape will be preserved as is, or restored to an earlier period. The coast guard station has been adapted for interpretation, and actions have been taken to adapt the fruit cannery building for a boat museum. Some buildings in the village, such as the Sleeping Bear Inn, have had limited exterior preservation treatments but are not used at present. Other buildings, such as the D.H. Day Store, are still in private hands under "use and occupancy" agreements with former owners. When these agreements expire, the buildings will be vacated and maintenance will become the responsibility of the Park Service. Unused structures have deteriorated due to the lack of normal maintenance associated with occupancy, and NPS costs to maintain the buildings have increased. Costs will rise further as use and occupancy agreements expire. A specific strategy for the use (or nonuse) and treatment of the historic structures and landscape is needed to guide park maintenance, development, interpretation, and funding decisions.

Visitor Use and Interpretation

Although use has grown somewhat in recent years, Glen Haven Village has not yet become the "major tourist attraction" anticipated in the 1979 GMP. The area still has the potential to become an important regional attraction. As mentioned above, the Coast Guard station has been adapted for regional maritime history interpretation, and the cannery is being adapted for a boat museum to supplement the maritime interpretation theme. While future visitor use levels are difficult to predict, updated projections are needed to guide management and development decisions. Other interpretive themes--logging, agriculture and recreation--are not sufficiently presented in the existing facilities.

As proposed in the GMP, campsite density at the D.H. Day Campground was reduced. However, this was accomplished by removing selected sites, lowering the total capacity from 124 to 88. The intent of the GMP was to retain the existing capacity by redesign and expansion. The campground regularly fills during the busy summer season resulting in visitors being turned away. In 1980, a new campground design was prepared, but implementation was deferred pending the outcome of the docking facility study discussed above. The 1980 design needs reevaluation because: (1) the D.H. Day Campground has a tradition of use that dates back to the early state park program in Michigan; (2) a total redesign would be costly, and (3) upgrading facilities may result in greater visitor use pressures exacerbating the capacity problems.

Other visitor facilities proposed in the GMP, such as trails and picnic areas, also need to be reevaluated, and updated proposals incorporated in the DCP.

Access and Circulation

The GMP proposals for restricting vehicular access in Glen Haven Village and providing parking, roads, and a public transportation system have not yet been implemented. These concepts are major elements that need reevaluation and updating to reflect new visitation projections, cost concerns, and current park management needs. Existing village parking is poorly defined and inadequate in size during heavy use periods. Visitors currently park along road shoulders, in private drives, or pull off on the grass. As guaranteed by land protection documents, access must be assured for private lands and for reservations of use and occupancy during the term of the agreements.

Since completion of the GMP, funding for public transportation systems in National Park System units has been reduced. The GMP says a system "may" be provided and proposes a feasibility study to determine costs and other factors. Because the decision affects other issues, such as parking facility demands and locations, the feasibility study needs to be completed and a more definite direction set for the next 10 to 15 years.



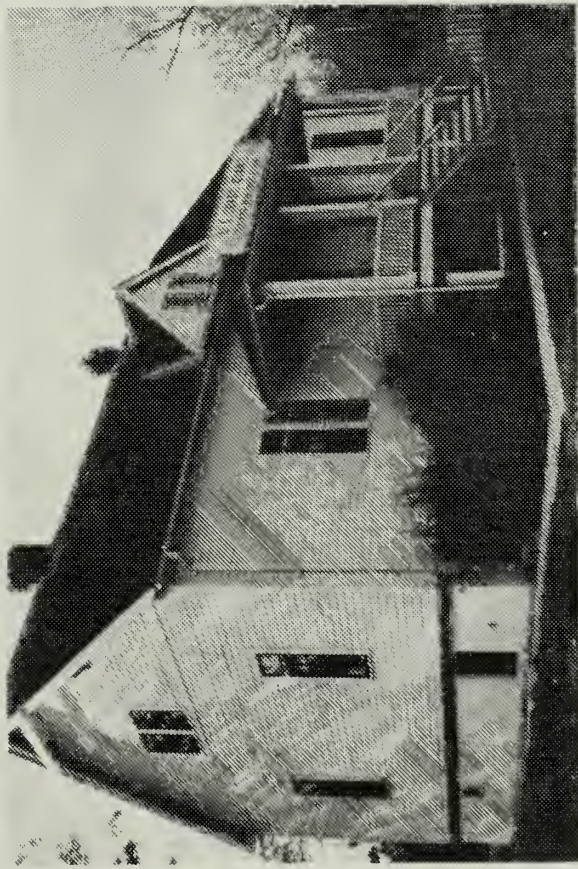
Lake Michigan shoreline at Glen Haven



Coast Guard Station/Maritime Museum Complex



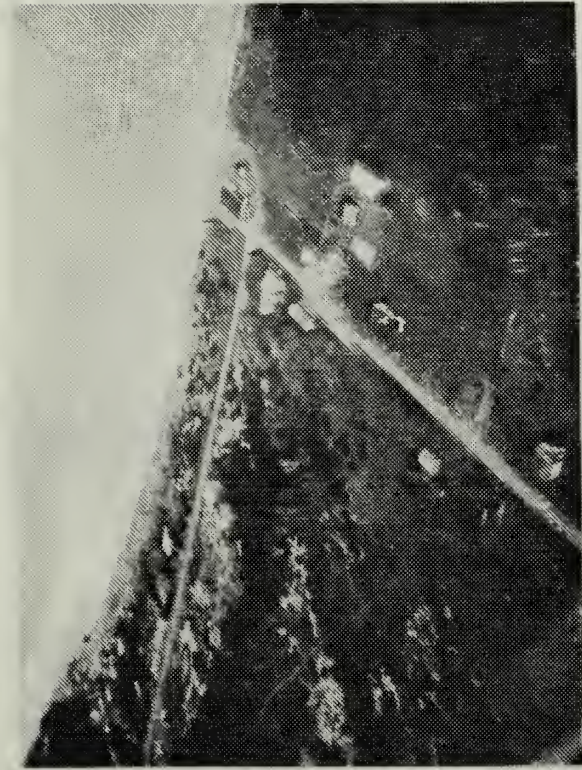
Sleeping Bear Point trailhead



Coast Guard Station main building



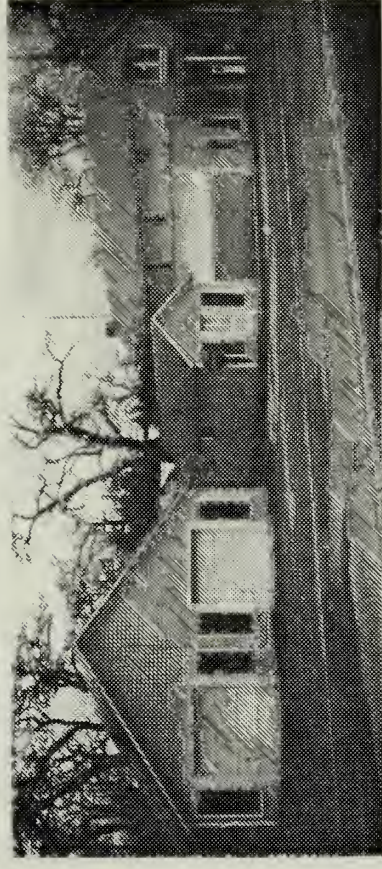
Existing picnic area near cannery



Glen Haven



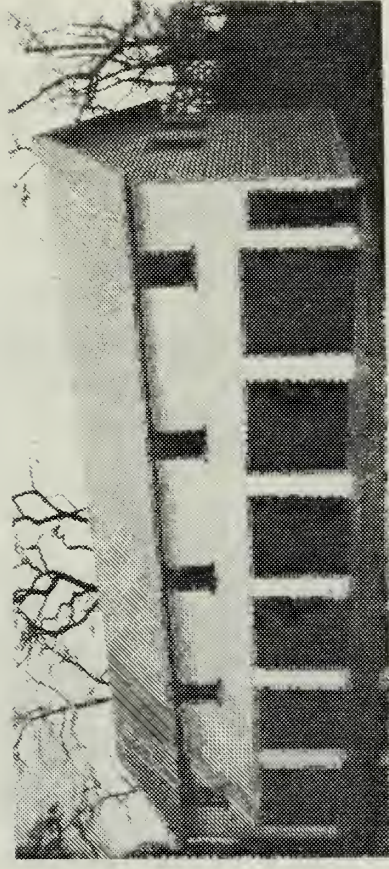
Glen Haven Village



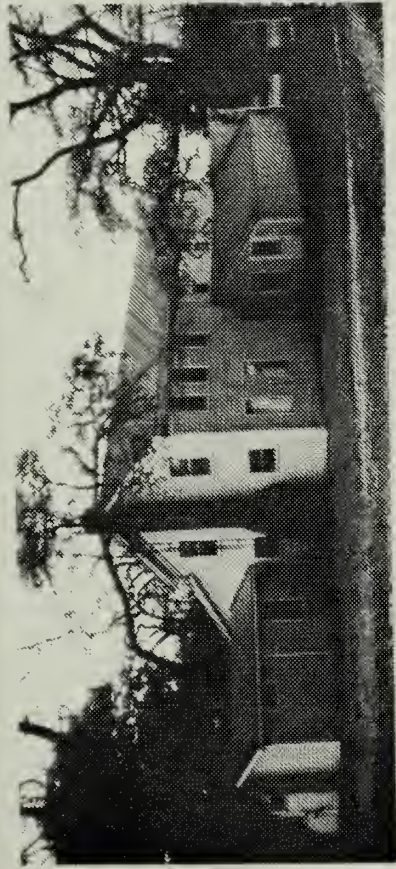
Store garage, storehouse, and store



Sleeping Bear Inn



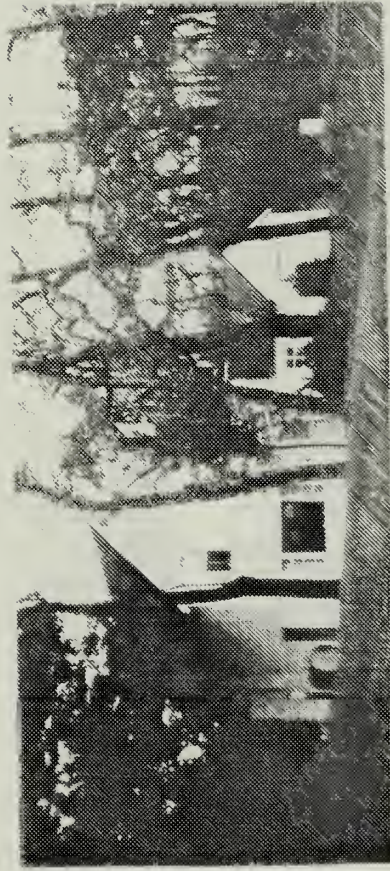
Sleeping Bear Inn garage



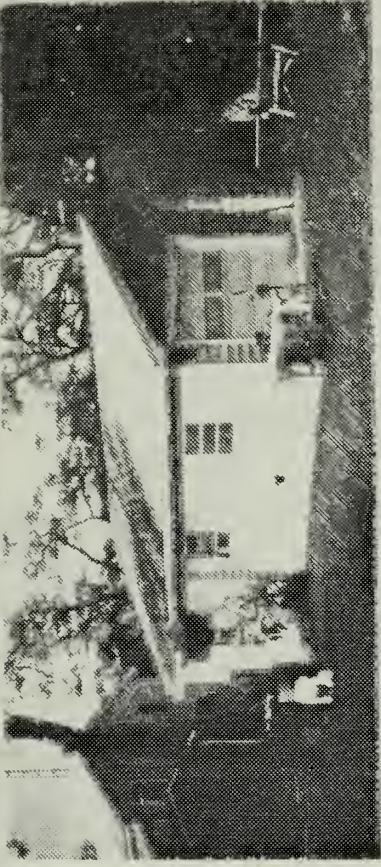
D.H. Day Store



Store outbuilding 2



William Day house



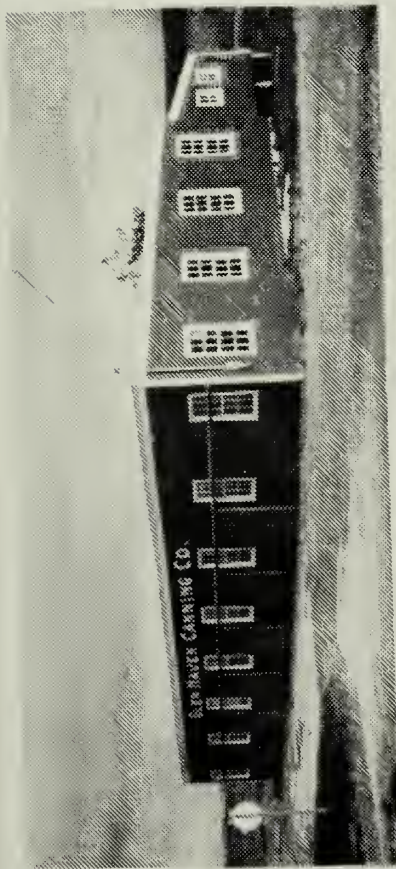
Store outbuilding 1



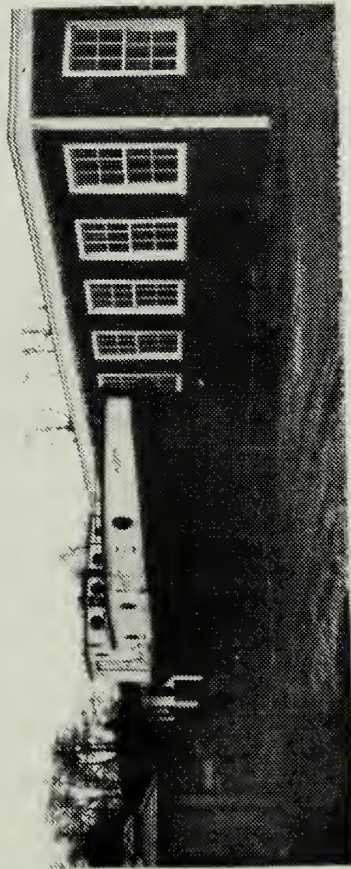
Pole barn



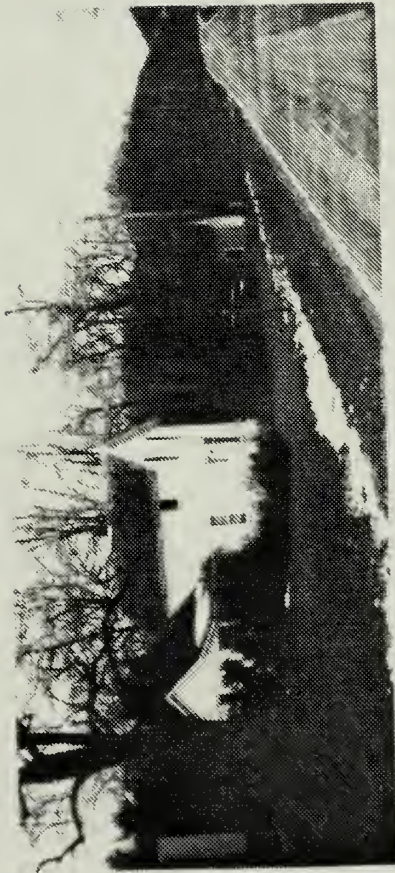
Dean house



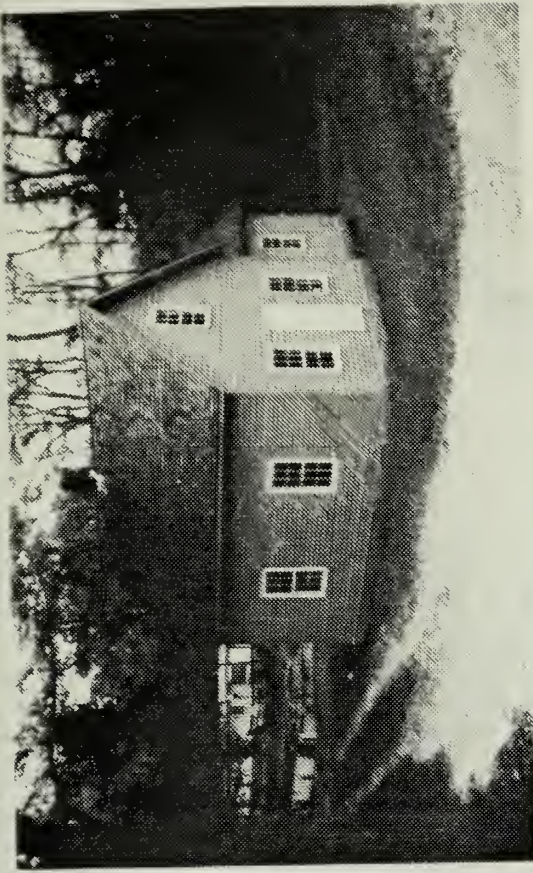
Cannery



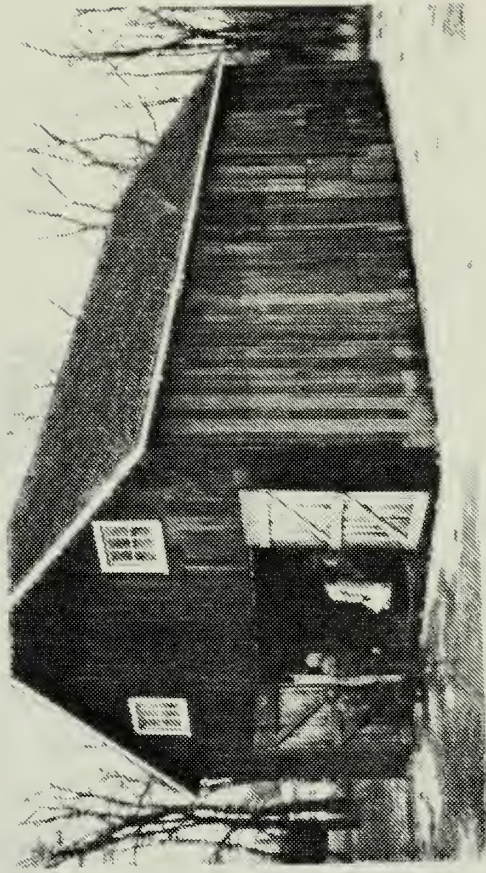
Fish tug next to cannery



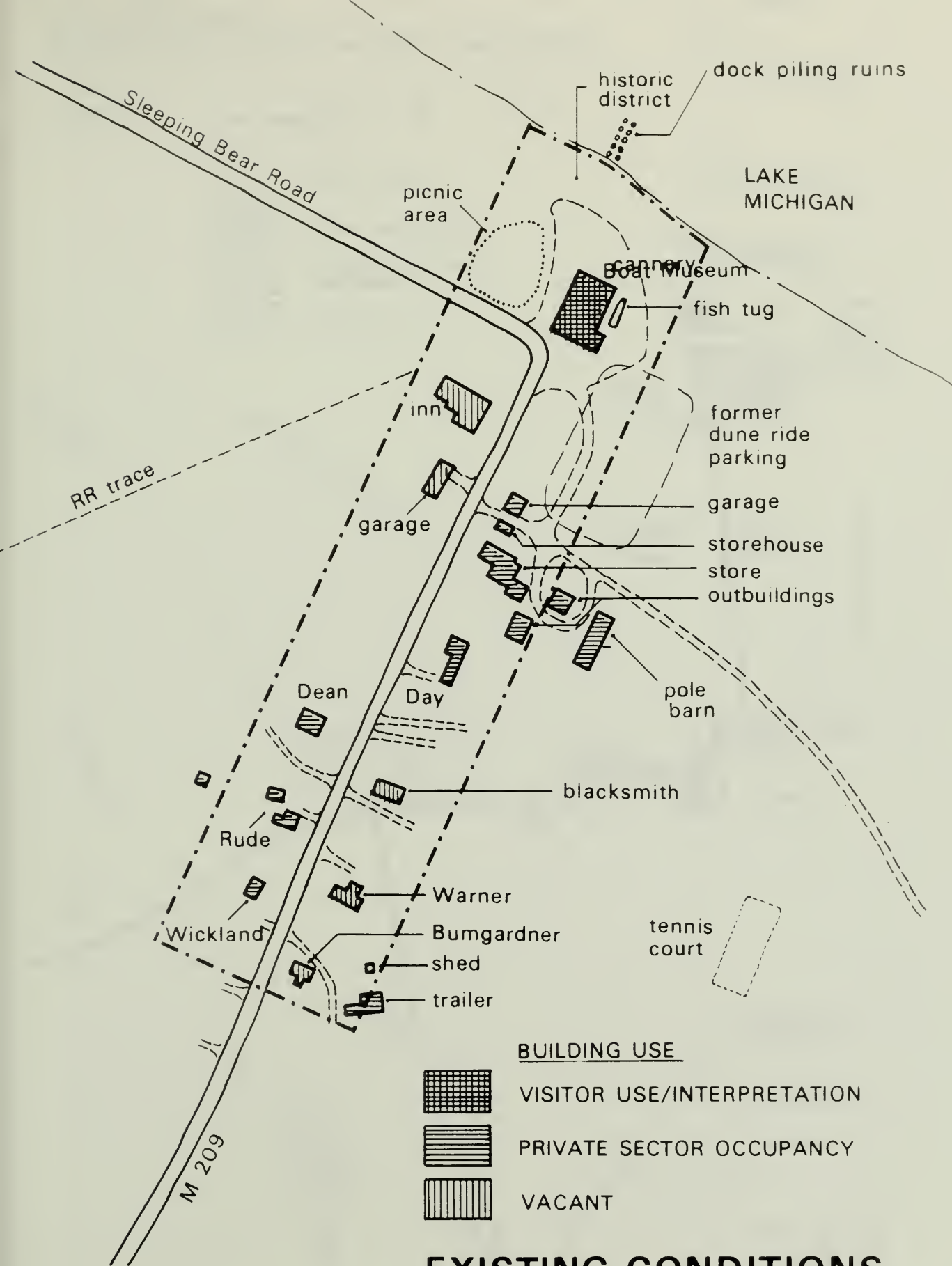
Warner house



Bumgardner house



Blacksmith shop



BUILDING USE



VISITOR USE/INTERPRETATION



PRIVATE SECTOR OCCUPANCY



VACANT

EXISTING CONDITIONS GLEN HAVEN VILLAGE

SLEEPING BEAR DUNES NATIONAL LAKESHORE
U.S. Department of the Interior / National Park Service

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feet



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Existing conditions/LAND STATUS

GLEN HAVEN AREA

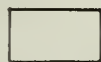


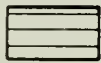
SLEEPING BEAR DUNES NATIONAL LAKESHORE

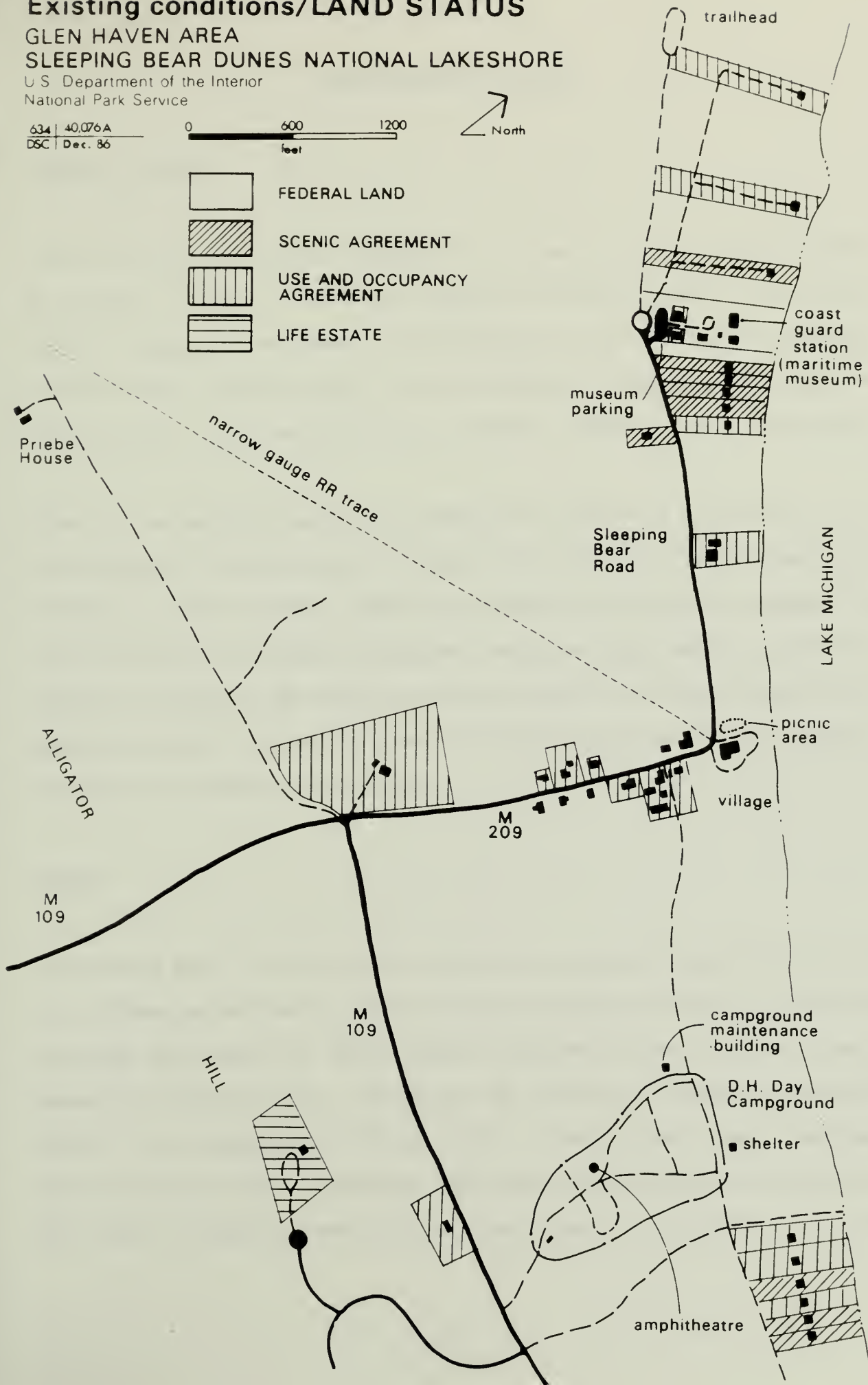
U.S. Department of the Interior
National Park Service

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feet



-  FEDERAL LAND
-  SCENIC AGREEMENT
-  USE AND OCCUPANCY AGREEMENT
-  LIFE ESTATE



DESCRIPTION OF THE AREA

REGIONAL SETTING

Sleeping Bear Dunes National Lakeshore is in the five-county Grand Traverse Bay region, an area of diverse recreation resources that is attracting growing numbers of vacationers and permanent as well as summer residents. Traverse City, 20 miles east of the lakeshore, provides the majority of transportation (air and bus) and visitor services for the region.

Access to the mainland portion of Sleeping Bear Dunes is by way of U. S. 31 and Michigan 22 from the south, Michigan 72 and U. S. 31 from the east, and Michigan 22 from the north (see Vicinity map). Michigan 22 traverses the entire length of the national lakeshore. North and South Manitou islands are seasonally accessible by boat from Leland, which is five miles north of the lakeshore boundary. Launching sites and docking facilities for private boats are located in Frankfort and Leland.

HISTORY

The Sleeping Bear Point Coast Guard Station was originally constructed by the U.S. Lifesaving Service at a location near the Point in 1902. In 1931 the buildings were moved to their present location by the U.S. Coast Guard because of shifting sands. The station now consists of a dwelling structure (HS-18), two boathouses (HS-20 and 19), a steel signal tower, and wash house building (HS-21). Boathouse #2 (HS-19) was converted to a garage in 1931 when the general consolidation took place. The station's term of

active service ended in 1942. During its entire life it never had to contend with a major maritime disaster or perform any spectacular rescues. Its history had more to do with the steady humdrum performance of routine duties, the timely giving of warnings to ships, a few minor rescues performed, and other types of assistance rendered. The station crew spent most of its time performing the drills to prevent mishaps and carrying out its routine chores of daily housekeeping and preventive maintenance. In 1970 the station became part of the national lakeshore and on April 26, 1979, it was placed in the National Register of Historic Places. It was judged to have "statewide" significance.

The history of Glen Haven Village was dominated by the personality of a single man, David Henry Day. This is true despite the fact that a few of the extant structures were built before Day's arrival in 1878. The Sleeping Bear Inn (HS 25-106A) for example, is reputed to have been built as early as 1857. This building, as well as others, nevertheless took on the imprint of Day's forceful management after he came to the place as the operations manager for the Northern Transit Company. Within three years after his arrival he had bought out the company holdings at Glen Haven while still maintaining a working relationship with the company.

Day's achievement at Glen Haven runs the gamut from supplying cordwood for Great Lakes steamers, to logging timber for lumber, providing a stopping place for both transient travelers on the lakes as well as for incipient settlers on the Michigan mainland, and beginning an agricultural system that finally evolved into the successful cherry growing fruit farming of northwest Michigan. From the national perspective, Day's endeavors best illustrate the

major theme of "America at work;" for he was functioning as an industrialist who utilized the technologies for cutting timber either for cordwood or lumber; running a sawmill to prepare the lumber for export; moving the finished lumber by rail and locomotive to his dock for transport to the major U.S. markets, principally Chicago; beginning an agricultural establishment that at first engaged in dairying and stock raising; and finally moving into fruit horticulture and resort development. The resort aspect burgeoned further after Day's death in 1928, and together with a cherry cannery, thrived until after World War II. Sleeping Bear Inn continued to function as a resort spot until 1972.

NATURAL RESOURCES

Topography

The topography of the Upper Great Lakes region -- Michigan, Wisconsin, and Minnesota -- has been sculptured by geologic processes. The most evident examples are glacial remnants of the last great ice ages -- moraines, lakes, and drainage channels. Post-glacial lake formations are present, and although they are not highly visible, they illustrate an important part of the geological story. The processes that are changing the landscape today include the gradual filling of bays, the erosion and accretion of beaches, the wearing away of headlands, and the formation of sand dunes, such as Sleeping Bear Dune itself.

Sand Dunes

Sand dune preservation was one of the primary reasons that the Sleeping Bear area was designated as a national lakeshore. The Sleeping Bear Dunes, just west of Glen Haven, is the largest dune complex in the lakeshore. The State of Michigan passed the Sand Dunes Protection and Management Act to protect dunes along the state's shorelines. Much of the active dunes area in the national lakeshore has been classified as a designated sand dune area under the act.

Soils

Except for some areas of muck, the soils are generally sandy, well-drained and very susceptible to erosion -- especially where there are strong off-lake winds and vegetation has been removed. Steep slopes also increase the vulnerability of soils to erosion.

At Glen Haven most soil material is well-drained, nearly level to gently sloping, and sandy in texture. Small areas of muck soils occur in low areas. None of the soil types present at Glen Haven have been designated prime or unique farmland by the Soil Conservation Service.

Vegetation

The most common natural vegetation types in the lakeshore are beech-maple and aspen-pine-oak forests. Beach and active dune, heath, and wetlands vegetation types are most sensitive to human use. At Glen Haven, beach and

active dune, heath, transition zone, and pine-oak-aspen forest types are present. In general, vegetation sensitivity to human use decreases with distance from the lake. All associations are sensitive to wind erosion if vegetation is destroyed. The forest vegetation type is the least sensitive because the trees act as windbreaks and the denser vegetation provides more stability.

Extensive populations of Pitcher's thistle, or the dune thistle (Cirsium pitcheri), a species listed as threatened by the State of Michigan and under review for listing by the U.S. Fish and Wildlife Service, are found along the shoreline near Glen Haven.

Floodplains and Wetlands

There are no streams or rivers in the Glen Haven area. According to a report prepared by the U.S. Army Corps of Engineers (COE 1977) and the Flood Insurance Administration's flood hazard boundary maps (FIA 1977), the 100-year Lake Michigan elevation is 582.4 feet (IGLD), the 500-year elevation is 583.0, and none of the existing structures at Glen Haven are in these floodplains. Wave runup should add less than two feet to these levels (COE, personal communication 1986). New record high levels were set for Lake Michigan in 1986. The previous all-time record high of 581.0 feet set in July 1974 was exceeded in October 1986 (COE 1986). The new record is 581.63 feet average for the month.

The National Wetlands Inventory (1980) includes two small wetland areas in the pine-oak-aspen forest and transition zone between the Sleeping Bear Dunes and M-209.

Wildlife

The largest mammal in the vicinity of the national lakeshore is the white-tailed deer. Smaller species that are common include raccoon, porcupine, snowshoe hare, cottontail rabbit, red fox, woodchuck, striped skunk, and mink, as well as a variety of squirrels.

Bird life is abundant and varied. Common species found in morainal plateau areas and active dunes are vesper sparrow, horned lark, goldfinch, and marsh hawk. In hardwood forests the red-eyed vireo, redstart, and ovenbird are common. Shorebirds, grebes, herons, ducks, rails, and loons are found in shore areas, marshes, and swamps.

The bald eagle (Haliaeetus leucocephalus), a federal threatened species, and the peregrine falcon (Falco peregrinus anatum), a federal endangered species, are occasionally reported in the Sleeping Bear area; but no nesting occurs there. Bird species experiencing regional population declines or range diminution include four hawks (sharp shinned, Coopers, red-shouldered, and marsh), the osprey, American kestrel, piping plover, and yellow and common yellow-throated warblers. The piping plover (Charadrius melodus) is listed as an endangered species by the U.S. Fish and Wildlife Service. The beaches near Glen Haven are potential habitat for the plover, although nesting has not been observed for several years.

Fish

Seventy-six fish species have been reported in the lakeshore vicinity. Of these, about 34 species are found in Lake Michigan, and the remainder inhabit inland lakes and streams. The most important sport fish are coho and chinook salmon, rainbow and brown trout, and rainbow smelt. In Sleeping Bear Bay, which includes the Glen Haven area, large schools of juvenile alewife, spottail shiner, longnose dace, and several young lake herring (a Michigan threatened species) have been observed.

Climate

Climatic conditions along the Lake Michigan shoreline have a pronounced influence on resources management, as well as on visitor use. Blowing sand in nonvegetated areas, cold winter winds, moisture, and fog all have a strong influence on plants and animals, the visitor experience, and the types of facilities that can be provided.

Extreme seasonal temperature variations and a fairly even annual distribution of precipitation are typical of the Upper Great Lakes region. However, climatic conditions in the vicinity of Sleeping Bear Dunes National Lakeshore are strongly influenced by Lake Michigan, which has a stabilizing effect on air temperatures. Because of the prevailing westerly winds, winters are milder and summers are cooler along the shoreline than in the interior. This moderating effect on shoreline air temperatures results in a growing period of 150 days for agricultural crops, compared to a period of only 100 days a few miles inland.

Air Quality

Sleeping Bear Dunes National Lakeshore is an "attainment class II" air quality area. This means that it is in a "clean air region" where air quality is better than the applicable national air quality standards, and good air quality maintenance is an intermediate priority. Deterioration to specified increments over baseline concentrations is permitted. There is an EPA/state sponsored air quality monitoring station at the lakeshore's visitor center about four miles south of Glen Haven. The results of this monitoring suggest that pollution levels are generally low at the park. Occasionally, high acid rain levels are recorded.

Water Quality

Lake Michigan waters in the vicinity of Sleeping Bear Dunes National Lakeshore are considered to be of very high quality (personal communication, David Kenaga, Michigan Department of Natural Resources, December 12, 1981).

Visual Quality

The Glen Lake area has more geologic features than any area in the lakeshore, ranging from wave-cut bluffs and a classic perched dune to a glacial drainage channel outwash fan and symmetrical kettle. The vegetation includes the largest old field juniper in the national lakeshore and a relic (or ghost) cedar forest. From higher portions of the area one can see Glen Lake, the Manitou Islands, dunes, Sleeping Bear Bay, and Lake Michigan.

CULTURAL RESOURCES

Archeology

Several archeological reconnaissance surveys were made in the Glen Haven area in 1981 and 1982 by the Midwest Archeological Center: in the area west of the village; in the area between the village and the D. H. Day Campground; and at the Sleeping Bear Point Coast Guard Station. West of the village, the survey identified several historic dumpsites, recent cultural debris such as broken china and pottery, a historic railroad grade (ca. 1907), the historic Pine Street alignment, and the routes of the old telephone lines to the Coast Guard station and the Manitou Islands. In addition, archeological remains of the dock, a roundhouse, barn, and probably other outbuildings are likely. In the area between the village and the campground, the survey found several small dumps, scattered historic artifacts, the remains of a historic ice-skating rink, curling court, tennis courts, and the historic alignment of Pine Street. Remains of a former slaughterhouse, outbuildings, and an early 20th century Native American community are believed to exist in the area. At the Coast Guard station, in 36 shovel tests nothing of consequence was uncovered, probably due to the extensive landscaping efforts undertaken by Coast Guard personnel during the active life of the station.

Because of extremely poor ground surface visibility within much of the area surveyed, the team recommended that intensive, systematic shovel-testing be conducted prior to construction at any site, as well as monitoring during construction by a knowledgeable member of the park staff.

Historic Resources

The Sleeping Bear Inn was listed in the National Register of Historic Places on September 6, 1979. The Glen Haven Village Historic District (including the Inn) was listed in the National Register on June 24, 1983. The inn and the village district were rated as having "local" significance during the listing process. The inn is significant because it was the first structure in Glen Haven and is a fine example of a frontier hotel. Glen Haven Village is significant because it is an excellent example of a turn-of-the century company lumbering town, one which was vital to the growth and economic well being of the Leelanau County area.

The Sleeping Bear Point Lifesaving (Glen Haven Coast Guard) Station was also listed on the National Register in 1979 with a "state" level of significance. It is significant for its architecture, site integrity, and relationship to a national system of aids to navigation.

For a complete list of the historic structures in the study area see Table 1.

VISITOR USE

Recreation visits to Sleeping Bear Dunes National Lakeshore have varied over the last ten years with no consistent trend of increase or decrease. This relative stability may be due to the largely local/regional visitation--it is estimated that 70 percent of Sleeping Bear visitors are Michigan residents. Visitation to Sleeping Bear Dunes is also very seasonal; peak use occurs in July and August.

There are no annual visitor statistics for the entire Glen Haven area. The maritime museum (Coast Guard station) was opened to visitor use in 1984. About 30,000 visits were recorded in 1985. Park staff estimate that 75 percent of the lifesaving station parking users tour the museum and participate in interpretive programs there, while 25 percent are in the area for beach recreation.

According to recent sampling (July and August, 1985) by the NPS Statistical Unit, current park-recorded visitation counts in the museum appear too low. Table 2 shows numbers of vehicles and visitors counted at each of three parking areas in the Glen Haven area -- the maritime museum the Dunes Trailhead, and the old cannery at Glen Haven Village.

TABLE 2: NUMBERS OF VEHICLES AND VISITORS COUNTED AT EACH OF THREE
GLEN HAVEN PARKING AREAS AT SLEEPING BEAR DUNES, JULY-AUGUST 1985

		<u>VEHICLES</u>	<u>VISITORS</u>
Maritime Museum Parking Area	July	3,660	21,220
	August	6,160	20,330
Dunes Trailhead Parking Area	July	860	2,860
	August	1,400	4,660
Cannery Parking Area	July	3,440	11,200
	August	1,850	6,350

Based on the NPS statistical unit's figures, average daily visitation to the Glen Haven area during July and August is estimated to be about 1000 people. Comparing the visitor counts at each of the three sites to the total count, it appears that approximately 63 percent of the visitors go to the maritime museum, approximately 11 percent use the trailhead, and about 26 percent stop at the cannery/village area. Translating the percentages into peak use daily averages, the maritime museum receives an estimated 630 people per day, the trailhead an estimated 110 people, and the cannery/village area an estimated 260 people. As facilities, programs, and activities are developed at Glen Haven Village, the percentage of visitation to the village can be expected to increase significantly.

Assuming that about the same numbers of people will visit the village as visit the maritime museum, and assuming a 2 percent per year increase in visitation at the Glen Haven area, visitation to the area may reach 1800 people per day by the year 2005. Because these estimates are not based on substantiated data, it will be important to evaluate them as visitation patterns are established in the area.

TABLE 1: GLEN HAVEN HISTORIC STRUCTURES

<u>NAME</u>	<u>NUMBER</u>	<u>DATE CONSTRUCTED</u>	<u>CONST TYPE</u>	<u>APPROX SIZE (SQUARE FEET)</u>	<u>CONDITION</u>	<u>CURRENT STATUS</u>
Sleeping Bear Inn	HS 25-106A	1857	Two-story frame with clapboard siding & gable roof	6,000	Fair	Federal/Vacant
Sleeping Bear Inn Garage	HS 25-106B	1928	Two-story frame with clapboard siding & gable roof	2,400	Good	Federal/Vacant
D. H. Day Store	HS 25-121A	1865	Two-story frame with clapboard siding & gable roof	2,000	Good	Private use and occupancy until 1993
D. H. Day Store- Storehouse	HS 25-121B	c.1910	One-story frame with clapboard siding	340	Good	Federal/Vacant

<u>NAME</u>	<u>NUMBER</u>	<u>DATE CONSTRUCTED</u>	<u>CONST TYPE</u>	<u>APPROX SIZE (SQUARE FEET)</u>	<u>CONDITION</u>	<u>CURRENT STATUS</u>
D. H. Day Store-Garage	HS 25-121C	c.1915	one-story frame with clapboard siding	820	Fair	Federal/Vacant
Glen Haven Signal Tower	HS 25-121E	Unknown	Diagonally- braced fabricated metal pyramidal	N.A.	Good	Federal
Warnes Blacksmith Shop	HS 25-121D	c.1860	Two-story frame barn with vertical siding & gable roof	900	Good	Federal/Vacant
D.H. Day Sawmill Site	No Longer extant	1868	Unknown	Unknown	Gone	N.A.
D. H. Day Narrow Gauge Railroad	Mostly obliterated	c.1880	Earthwork roadbed ten feet wide	N.A.	Deteriorated	N.A.
William Day House	HS 25-118	c.1890	Two-story frame	2,300	Good	Private use and ocoquancy until 12-1-92

<u>NAME</u>	<u>NUMBER</u>	<u>DATE CONSTRUCTED</u>	<u>CONST TYPE</u>	<u>APPROX SIZE (SQUARE FEET)</u>	<u>CONDITION</u>	<u>CURRENT STATUS</u>
Bumgardner House	HS 25-122	c.1890	1-1/2-story frame with clapboard siding T- shaped	1,350	Fair	Federal/Vacant
Warner House	HS 25-114	c.1898	1-1/2-story frame with clapboard siding	1,100	Fair	Federal/Vacant
Rude House	HS 25-107	c.1917	One-story frame with clapboard siding and gable roof	600	Good	Private use and occupancy until 2002
Rude Garage	HS 25-107A	c.1917	One-story frame with clapboard siding	400	Good	Private use and occupancy until 2002
Fruit Canning Factory	HS 25-153A	c. 1925	One-story frame with metal shed roof	3,000	Fair	Federal boat museum

<u>NAME</u>	<u>NUMBER</u>	<u>DATE CONSTRUCTED</u>	<u>CONST TYPE</u>	<u>APPROX SIZE (SQUARE FEET)</u>	<u>CONDITION</u>	<u>CURRENT STATUS</u>
Wickland House	HS 25-108	c.1928 to 1947	One-story frame	500	Good	Private use and occupancy until 1998
Dean House	HS 25-115	c.1928	One-story frame	1,250	Good	Private use and occupancy until 11-19-90
Coast Guard/ Life Saving Station	HS-18	c.1902	1-1/2-story frame	4,000	Good	Federal/Mari- time Museum
Lifesaving Station Boat- house/garage	HS-19	c.1902	One-story frame	1,000	Good	Federal
Lifesaving Station Boat- house	HS-20	c.1902	One-story frame with board & batten siding	1,300	Good	Federal/Mari- time Museum
Lifesaving Station Wash House Building	HS-21	c.1902	One-story frame with horizontal wood siding	200	Good	Federal

<u>NAME</u>	<u>NUMBER</u>	<u>DATE CONSTRUCTED</u>	<u>CONST TYPE</u>	<u>APPROX SIZE (SQUARE FEET)</u>	<u>CONDITION</u>	<u>CURRENT STATUS</u>
Lifesaving Station - self bailing lifesaving boat	HS-22	c.1902	N.A.	N.A.	Poor to fair	Federal
Lifesaving Station Signal Tower	N.A.	1914	Steel	N.A.	Good	Federal

EXISTING DEVELOPMENT

Access to Glen Haven is provided by state road M-209, a paved two-lane road. From the cannery west to the lifesaving station, the road is designated as Sleeping Bear Road, a county road.

There is very little parking available at Glen Haven village. Around the cannery there is unpaved parking for a small number of vehicles. Visitors also park alongside the road. Because there is inadequate signage, parking, and pedestrian access, the first-time visitor experiences a certain amount of confusion on arriving at the village. Development at the maritime museum (Coast Guard station), on the other hand, is well organized and provides signage, parking (20 car/2 bus), pedestrian access, and visitor restroom facilities. A nearby one lane, two-way road leads to a trailhead that provides access to the dunes near Sleeping Bear Point (see Existing Conditions Map).

The cannery, inn, blacksmith shop, and warner house in the village are open to visitor use when guided tours are given. The cannery is being adapted for a boat museum. There are two vault toilets nearby. The beach is open to the public, and there are about a half-dozen picnic tables in a grassy area adjacent to the cannery.

The D. H. Day Campground has 88 sites, an amphitheatre, water system, vault toilets and gravel roads. The campground fills nightly during the park's high-use season in July and August. Many visitors return year after year and consider the campground a traditional part of their vacation experience.

Estimates made from NPS statistical unit visitation counts in July and August of 1985 show daily averages of 630 people per day at the Coast Guard Station, 110 people per day at the Dunes trailhead, and 260 people per day at the cannery. Using an average of 3.3 people per car, these figures translate to 190, 33, and 78 cars at the three sites. Adjusting for average lengths of stay (one hour at the Coast Guard Station and at the cannery, and four hours at the trailhead), an estimated 25 parking spaces are currently needed at the Coast Guard Station, approximately 20 spaces are needed at the trailhead, and about 20 spaces are needed at the cannery/village area. Based on visitation projection estimates (see existing visitor use section and transportation system feasibility appendix), need for parking may increase to 35 spaces at the Coast Guard Station, 30 spaces at the trailhead, and 45 spaces at the village by the year 2005.

THE PROPOSAL

This section presents the proposed interpretation and development plan for the Glen Haven area. The overall concept is described in the 1979 GMP as quoted in the Introduction. Additional detail and variations on the 1979 plan are provided below. The current proposal represents the "minimum requirements" to manage the area effectively, except for the campground concept (which is the same as approved in the GMP). The minimum requirements alternative for the campground is described under Alternative 2.

Planning Objectives

Preserve the cultural landscape and interpret the history of the Glen Haven Area.

Protect natural resources in the area including the sand dunes, endangered species habitat, wetlands, and other critical resource elements.

Reduce or remove vehicular traffic from the village to preserve the historic scene, increase pedestrian safety, and enhance the visitor experience.

Provide opportunities for recreational activities consistent with natural and cultural resource protection needs.

Stimulate interest in regional maritime and other appropriate history themes for the area.

Demonstrate the interrelationship between the natural resources and cultural history of the region.

INTERPRETATION

The interpretive significance of Glen Haven Village is that it represents the typical small company-owned or dominated town that developed around the turn of the twentieth century along the shores of the Great Lakes, especially northeastern Lake Michigan. Typical of the entrepreneurial businessmen who owned and dominated the commercial and social life of these lakeshore communities was D. H. Day, the dominant figure in Glen Haven's history.

Over time, the companies engaged in a number of commercial enterprises such as lumbering, fishing, fruit growing and processing, and tourism -- using a broad range of regional resources in order to maintain an economic livelihood. To support these enterprises, the towns typically included a company store, company boarding house and a hotel, company-owned homes, privately-owned homes, warehouses, a blacksmith shop, a tramway for lumber products, a sawmill, a dock, and a company farm. Of these customary structures, all but the sawmill, dock, and warehouses still remain in the Glen Lake area. While all of the sawmill is now gone, the millpond remains, and the old dock pilings are still visible and a trace of the narrow gauge railroad can be found. The Glen Haven cannery is typical of many fruit processing plants that were developed in communities following the lumber era.

The village buildings and landscape will be preserved and maintained in their existing condition which largely reflects this 1920's. The area will not be restored or reconstructed because (1) restoration is not essential to visitor understanding of the area; (2) adequate data may not be available to duplicate restored features accurately; (3) restoration and reconstruction would be extremely expensive; (4) funding for such actions is becoming extremely limited; and (5) Park Service policy favors preservation over restoration or reconstruction. The Glen Haven story is one of establishment, growth, transition, and decline. To stress a particular earlier time period would be inappropriate where the significance lies in the whole story. Elements that have come and gone will be treated through publications, historic photographs, exhibits, and on-site personal services.

Primary elements of the interpretive program at Glen Haven will include:

- A. Orientation to the Glen Haven area -- its significance and how to visit it
- B. The story of the industries -- shipping, fishing, logging, agriculture, tourism -- as broad-based use of resources to maintain economic stability
- C. The story of life in the company town
- D. The story of D. H. Day and his empire

The National Register of Historic Places form for Glen Haven designates the village as having local significance, rather than state or national. Glen Haven can tell timber history, agricultural, and tourism stories, as well as having a connection to maritime commerce and Great Lakes fishing. While it is not a major historic town, it is a pleasant place to visit and one of a group of complimentary experiences in the general vicinity: the dune climb, Sleeping Bear Point hiking trails, beach use, camping, and the maritime museum.

The various extant structures at Glen Haven, plus a self-guiding folder and wayside exhibits, will be used to interpret the primary story elements and provide information and orientation about how to visit the Glen Haven area. Interpretive media will be provided that do not require staffing, at least in the near future, but that are adaptable to occasionally staffing if necessary or desirable later. A separate visitor contact/interpretive station is not recommended for the village. In the following proposal and alternatives for development, the emphasis and locations for interpretation of some elements may change, but the basic elements remain constant.

VISITOR USE AND DEVELOPMENT

The general concept for development is to provide cost-effective facilities and media to achieve interpretive objectives, provide the desired visitor experience, encourage adaptive uses, and accommodate the anticipated increased visitation while preserving the area's historic integrity and appearance. Historic structures will be adaptively used in a variety of ways, including interpretive, private, and administrative uses.

Village Access, Circulation, and Parking

The general concept for village access, circulation and parking is to allow visitors to drive to a central parking area providing about 45 parking spaces located approximately 300 feet west of the village (see Proposed Development map). Handicap parking spaces and a hard surface trail will assure that all visitors have access to the village. A general orientation wayside exhibit will be located at the parking area where a self-guiding folder will be picked up. Visitors will be directed to an interpretive wayside positioned near the fruit cannery building that will provide information about the lake/village interface at a site near the former dock (the traditional entrance to the village) where the entire village can be seen. The existing stretch of M-209 in the village would be made a secondary one-way road for slow speed local traffic, visitor drop-off, and pedestrian circulation. This proposal will require the concurrence of the Michigan Department of Transportation. The stretch of Sleeping Bear Road from the cannery west approximately 800 feet would also be made one-way, with the concurrence of the Leelanau County Road Commission. The new road alignment around Glen Haven will enhance the historic scene and reduce vehicle-pedestrian conflicts in the village, while assuring access to private lands in the area.

The 1979 general management plan recommended redesigning the M 109/209 intersection. The plan includes a development concept for consideration by the state (see Proposed Development map). The concept is to make the primary route (M-109) a continuous through road, with M-209 as the secondary road.

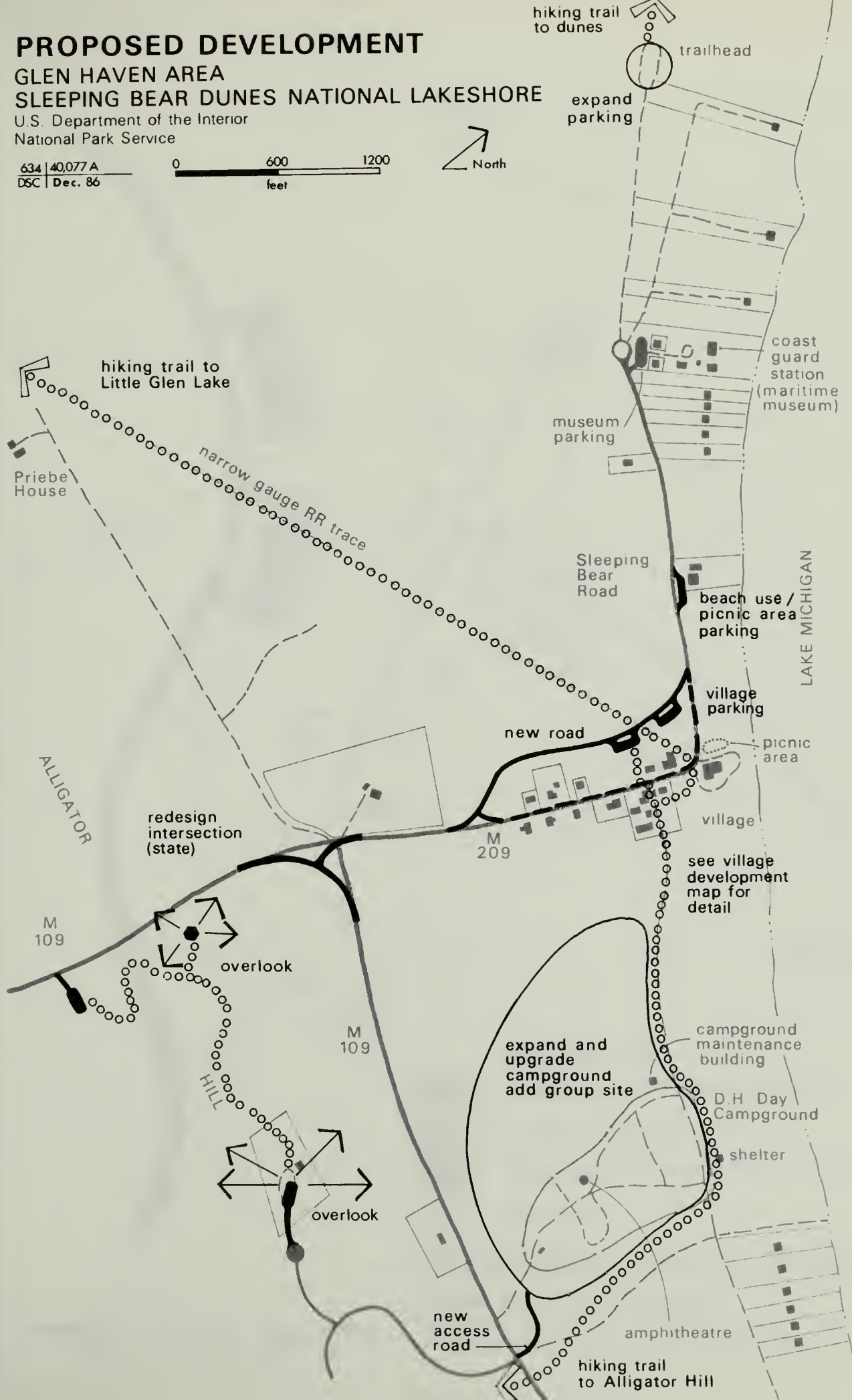
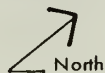
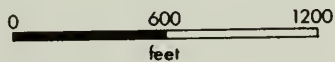
PROPOSED DEVELOPMENT

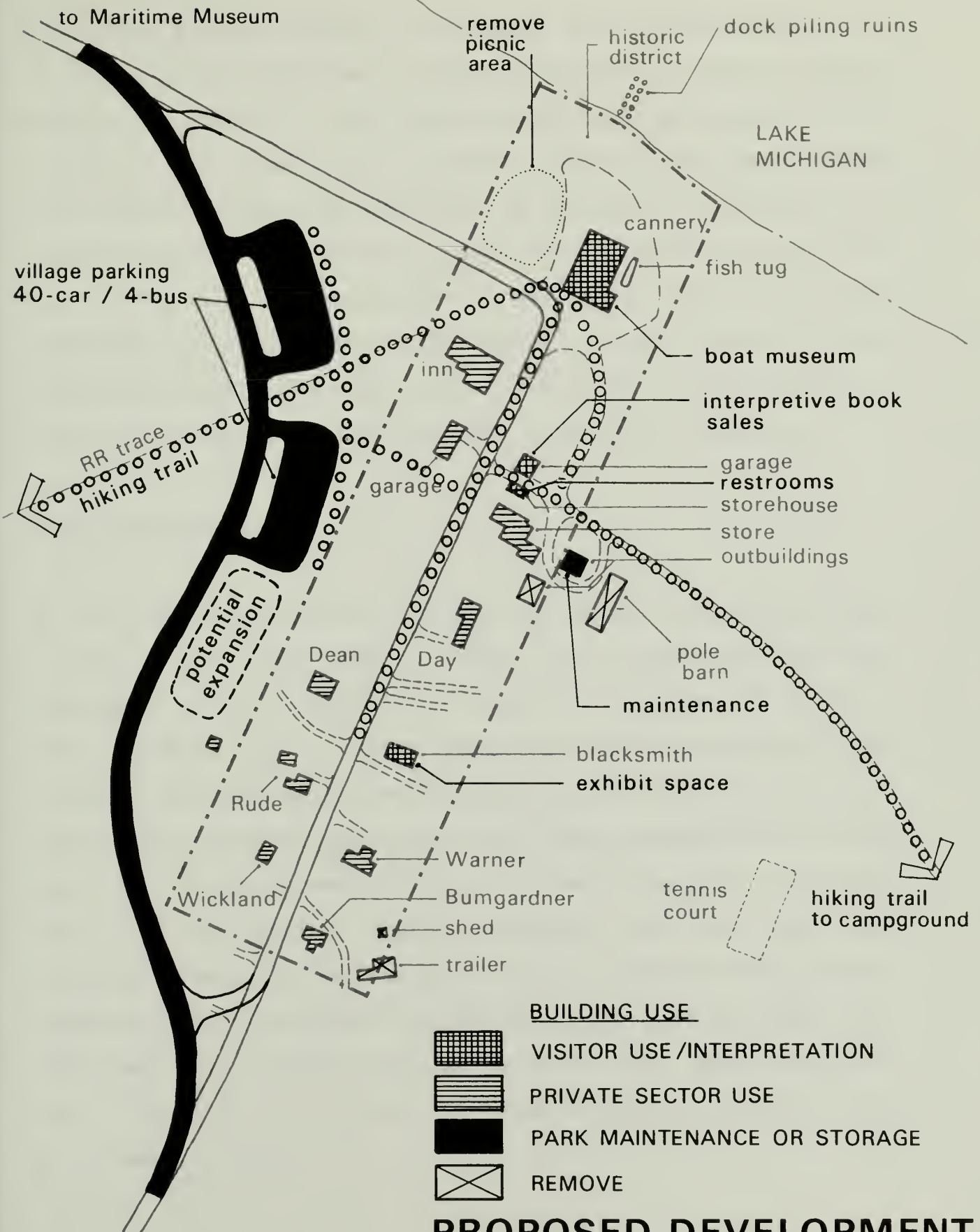
GLEN HAVEN AREA

SLEEPING BEAR DUNES NATIONAL LAKESHORE

U.S. Department of the Interior
National Park Service

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PROPOSED DEVELOPMENT **GLEN HAVEN VILLAGE** SLEEPING BEAR DUNES NATIONAL LAKESHORE U.S. Department of the Interior / National Park Service

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At this time a shuttle system is not proposed for the Glen Haven area. In the next ten years, anticipated visitation is inadequate to support a shuttle operation (see Appendix). Under the current proposal, parking areas will be available at the village, near the beach, at the coast guard station and at the trailhead to accommodate expected use for the next 10 to 15 years. This strategy forestalls development of a large (200+ car) parking area while not closing options for a shuttle system in the future if use levels exceed projections. The Park Service will, however, encourage expansion of the county public transportation system to serve the Glen Haven area, as well as other nearby activity areas in Sleeping Bear Dunes National Lakeshore.

Interpretive Facilities

The fruit cannery building will continue to be used as a boat museum because it offers a large open space to display boats and because Glen Haven historically has ties to Great Lakes maritime industries. A series of exhibit panels will be created to augment and interpret the boats. A few maritime artifacts may be selected for museum case exhibits. This should not become a major occupier of space because the primary use should be to display boats. The fishing equipment display, in a separate room, will be developed into a peek-into display, probably by sealing the open windows with plexiglass. The cannery will be able to operate without staffing, but at times when a roving interpreter is available, programs could be offered. One simple panel will interpret the cannery's historic use. Some work will be done to the building to provide handicapped access and to tighten it up against weather and dirt.

The fish tug will continue to be displayed adjacent to the cannery, where it is somewhat shielded from view. It should not be a dominant feature of the view: the tug should merely be an extension of the indoors boat display, outside only because it is too big to place in the cannery. An exhibit will interpret it. A viewing platform will be built next to the tug to allow visitors to look inside the cabin.

The blacksmith shop will be provided with a floor and will contain large objects which are related to other historic activities, such as agriculture and logging. The objects will be selected for their appropriateness, with definite ties to the village themes. It will not be staffed. Although the exterior signing will identify the building as a museum exhibit, a simple panel on the interior could interpret the historic blacksmithing function. Handicapped access will be provided.

The proposed self-guiding folder will be part of an existing existing folder series developed by the lakeshore staff. Folders in the series include one on each island, various hiking trails, and other features. They are attractive, have a family resemblance, and contain text, graphics, and photographs, some of which could be used in the walking tour folder. The folder will be dispensed at the wayside kiosk which provides general orientation to the village, located at the parking lot. At a later time, if it appears there is enough of a market, a more lengthy publication may be developed.

The double garage north of the store will be used for cooperating association sales. This is the only place in the general vicinity that visitors will have access to such an outlet. Half of the building will be designated for this use. It may be staffed by an employee or by association personnel who could also dispense park information. It will be a seasonal operation capable of opening and closing easily depending on staffing availability and demand. The sales items will not overlap very much with those in the general store. At some future time, the other half of the double garage building may developed for another interpretive use, such as an exhibit area, but for the life of this plan the need has not been demonstrated.

A series of about ten wayside exhibits will be planned and produced:

- To orient visitors to the village. High profile, perhaps multi-panel, located at the parking lot. Include folder dispenser (for village walking tour). Might include a collage of historic photos and an oblique aerial photo of village.
- To interpret village/lake interface, specifically the dock and the ships that used it and also the islands in view from here.
- To orient users of the Sleeping Bear Point trail. Located at trailhead.
- To interpret the fish tug.

- To interpret the D. H. Day farm.
- To interpret the view from an overlook southeast of the village near M-109. Perhaps more than one panel. Trail to overlook will begin at a roadside parking area.
- To interpret the view from the "Quick" overlook.
- To orient users of hiking trail from campground to village.

In addition to these waysides, a coordinated signing system will be developed to identify functions of various village buildings. These should be in keeping with the setting. Integrated road signing is also needed to provide safe conditions and adequate notice of features (coordinated with the state):

The D. H. Day Store Storehouse will be converted to a public restroom building to serve the village area. The structure will be accessible to handicap visitors.

Adaptive Use of Historic Structures

Other historic buildings in the village will also be adaptively used if feasible, but they are not needed for visitor services, interpretative space, park administration, or other park management functions. Therefore, they will be advertised for lease to others under the Historic Properties Leasing Program for appropriate uses. These may include restaurants, lodging, hostels, stores, arts and crafts shops, bed and breakfast operations,

studios, or private residences. If the proposed adaptive use will provide accommodations, facilities, or services to a substantial number of park visitors, then the building will probably be made available under a lease and the visitor use may be provided through a concession contract. It is desirable to have the primary historic structures, the Sleeping Bear Inn, and the D.H. Day Store, open to the public and handicap accessible if feasible. Preference will be given to traditional uses at the inn and store. Other leased structures may or may not be open to the public depending on their eventual use. A "request for proposals" will be issued for vacant structures to solicit interest in leasing. Structures currently under occupancy agreements will be leased when the use terms expire. Building interiors may be rehabilitated (remodeled) to accommodate the approved use, but in all cases, exteriors will be preserved. Small signs will identify adaptive uses but they will be designed to be compatible with the historic scene.

If any of the historic buildings cannot be adaptively used now by the private sector, the Park Service will continue to stabilize and maintain the structures until adaptive uses can be arranged.

Administrative Facilities

One of the houses in the village will be used as a park residence as proposed in the quarters management plan that was recently approved for the park. This will provide some protection to the structures in the area because a park ranger will be living in the area.

There is a need to have limited maintenance space to support park operations in the Glen Haven area. This includes some storage of materials and workspace for historic preservation activities. Because these activities can cause an intrusion on the visitor experience and historic scene, they will be housed in a nonhistoric building just outside the historic district behind the D. H. Day Store (when the use and occupancy agreement expires in 1993).

Nonhistoric Structures

Other nonhistoric structures will be removed to reduce maintenance costs and improve the scene. These include a steel pole barn and a concrete block garage behind the store. These structures were constructed in modern times to support the dune ride operation that was eliminated in 1978. They do not contribute to the historic scene according to the National Register nomination forms. Because these structures are still under a use and occupancy agreement, they will not be removed until the term expires in 1993. Since the pole barn is a useable structure it will be relocated to another maintenance area in the park.

A modern house trailer behind the Bumgardner house will be removed. A structure west of the Rude house was not inventoried in the special history study for Glen Haven (NPS, 1984). It will be preserved until evaluated to determine if it contributes to the character of the historic district. If historic, it would be leased for private uses. If nonhistoric, it would be removed.

The curling court and tennis court east of the blacksmith shop are not within the district but relate to the recreation theme. The curling court is in an advanced state of deterioration. Both are considered "archeological" resources that will be allowed to deteriorate naturally.

Maritime Museum

Use of the coast guard station as the center for maritime history interpretation will be continued to supplement and not duplicate village facilities. Adaptive rehabilitation, exterior restoration, interpretive exhibits, and site development are essentially complete. Two adjacent houses (Fitzgerald and Jacklin) are under long term use agreements until 1998 and 2002. These structures were not included in the National Register nomination for the station, but will be reevaluated because of their relationship to the Coast Guard activities (they provided housing for families). If determined eligible, they would be preserved with adaptive uses as residences. If not, they would be removed when the use and occupancy terms expire.

The museum parking area is adequate at present, but it operates near capacity during the peak season. The 1979 GMP proposed that the dunes area trailhead be combined with the coast guard station parking. This development concept plan proposes retaining the museum parking at its current capacity and leaving the trailhead in it's current location. While future increases in visitor use may cause demands beyond the museum parking capacity, it is considered to be appropriately sized for the capacity of the museum itself. Therefore, parking area expansion is not recommended. The recently completed turnaround at the end of Sleeping Bear Road has been leased to Leelanau

County for 99 years and will remain basically as is. The access roads to private residences west of the museum should be consolidated with the trailhead road to reduce potential visitor confusion and improve safety near the turnaround.

Trails

Glen Haven area trails will be developed as generally proposed in the GMP. A loop trail will be designated in the dunes area; however, the existing gravel trailhead near the dunes will be retained and expanded by 10 cars to accommodate increased use. The gravel access road would be widened to meet Park Road Standards if traffic increases to more than 100 vehicles per day (one-way ADT) during the summer.

A hiking (not bicycle) trail will connect Glen Haven to Little Glen Lake using the old narrow gauge railroad grade. The village parking area will serve as a trailhead. Accessible trails will provide circulation in the village and connect to the D. H. Day Campground. A hiking trail will connect the campground to the Alligator Hill area forming a continuous trail system in the Glen Lake area as envisioned by the GMP.

Campground

The D. H. Day Campground will be extensively rehabilitated and upgraded as proposed in the GMP. It will be redesigned for about 125 sites (the original capacity), and group sites for about 80 people will be included. Paved roads, showers, and flush toilets will be provided. A portion of the new

sites and toilets will be handicapped accessible. The entrance road will be realigned to match Stocking Drive (see Proposed Development map), and the amphitheatre, which is currently in the center of the campground, will be relocated to a more appropriate site. It also will be designed to accommodate handicapped persons. The exhibit on the history of the campground will be maintained outside the old shelter building, and interior lighting will be added to make the buildings more usable for interpretive programs.

Beach Use and Picnic Facilities

As discussed above, the village parking area will continue to provide for some beach users, as it has in the past. To provide another option and reduce pressures on the village parking, a small (up to 10-car) parking area will be developed between the village and the coast guard station. The parking will occupy an area already disturbed as former house sites.

The GMP proposed one picnic area near the main parking area. This plan proposes a small (up to 5-site) picnic area at the beach use parking area described above. This will remove developed picnicking from the village historic district.

Overlook

The GMP proposed a developed overlook on Alligator Hill southeast of Glen Haven. This DCP recommends two overlooks with a connecting trail (see map). The sites offer excellent views of Lake Michigan, Glen Haven, and the D.H.

Day Farm near Little Glen Lake. They offer an opportunity to visually tie the entire Glen Haven story together. One overlook near M-109 will be accessible only by trail. The other one, at the "Quick" place, will be accessible by vehicle when it is developed.

The overlook site near M-109 offers the best 360° views of the entire area (with some vista clearing). A small (up to 10-car) parking area will be provided at the base of the hill. A wayside exhibit at the parking area will interpret the D.H. Day Farm. Waysides at the overlook will address the entire area. The "Quick" site has good road access and is already disturbed by residential development. A small (up to 10-car) parking area and wayside exhibits will be provided. The "Quick" overlook is a long-range proposal. The property is federal land under a life estate agreement, which permits lifetime occupancy by the former owner. The overlook will not be developed until the residence is vacated at which time the structures would be removed.

Table 3 summarizes the proposal, as well as alternatives being considered during preparation of the development concept plan. The alternatives are described in further detail below.

IMPLEMENTATION COSTS AND PRIORITIES

The estimated development costs to implement the proposal (and alternatives) are displayed in Table 4. Impacts to the annual operations budget are contained in Appendix B. The costs for remodeling the Sleeping Bear Inn and other historic structures proposed for private sector use are contingent upon specific uses that will be solicited through proposals under the Historic

Properties Leasing Program. The Glen Haven Store will be available for leasing when the use and occupancy term expires in 1993.

Because of its historic significance and vacant status, the highest priority for implementation action is leasing the Sleeping Bear Inn for adaptive use, such as lodging and/or food service functions. A "request for proposals" will be issued to identify specific procedures and formally solicit interest in the inn (including the garage). Other vacant structures in the village will also be leased as soon as possible to obtain occupants to care for them.

Another high priority is the new parking area for the village. It will be constructed in conjunction with the road realignment project, which is probably several years away. The small beach use parking area, village restrooms, completion of the cannery interpretive center, and installation of interpretive waysides and signs are other high priority items.

In addition to the development costs shown in Table 4, there will be interpretive facility and media costs (gross) as follows:

Waysides	\$ 53,000
Cannery Boat Museum	
Text panels and case exhibits	40,000
Handicap ramp	2,000
Fish tug viewing platform	4,000
Blacksmith Shop Exhibit Building	
Install floor	7,000
Handicap ramp	2,000
Text panels	<u>18,000</u>
Store Garage (Association Sales)	
Remodeled	45,000
Furnishing	<u>9,000</u>
	\$180,000

TABLE 3: Comparison of Glen Haven Proposal and Alternatives

	PROPOSAL	ALTERNATIVE 1 No Action	ALTERNATIVE 2 Extensive Interpretive Development	ALTERNATIVE 3 GMP Proposal
Historic Structures Management	Exterior preservation interpretation, and adaptive use	Preserve exteriors only	Restore to 1920s and maximize interpretive use	Maximum adaptive use
Cannery	Boat museum (maritime history theme)	Continue boat museum	Interpretive center for village themes	Private sector use
Sleeping Bear Inn	Private sector use open to public	Continue exterior preservation	Private use open to public	Private use open to public
Sleeping Bear Inn Garage	Private use with Inn	Continue exterior preservation	Exhibit building for Glen Haven history	Interpretive overview exhibits
D. H. Day Store	Private use open to public	Preserve exteriors when use terms expire	Refurnished 1920s store	Visitor orientation center

PROPOSAL	ALTERNATIVE 1 No Action	ALTERNATIVE 2 Extensive Interpretive Development	ALTERNATIVE 3 GMP Proposal
D. H. Day Store Garage	Interpretive book sales	Preserve exteriors when use terms expire	Park Maintenance
D. H. Day Store Storehouse	Public restrooms	Preserve exteriors when use terms expire	Public restrooms
Blacksmith shop	Interpretive space for industry theme	Preserve exterior	Private use
William Day House	Private use	Preserve exterior when use term expires	Private use
Warner House	Private use	Preserve exterior	Private use
Bumgardner House	Private use	Preserve exterior	Private use
Wickland House	Private use	Preserve exterior when use term expires	Private use

PROPOSAL

ALTERNATIVE 1
No Action

ALTERNATIVE 2
Extensive
Interpretive
Development

ALTERNATIVE 3
GMP Proposal

Rude House	Private use	Preserve exterior when use term expires	Private use	Private use
Dean House	Private use	Preserve exterior when use term expires	Private use	Private use
Village area non-historic structures	Use one building for maintenance-remove others; no action on curling court or tennis court	No action	Use one building for maintenance-remove others; stabilize curling and tennis courts	Remove
Coast Guard station houses	Continue use as residences	No action	Exhibit space	Remove
Vehicular access in village	Prohibit private vehicles in village	No change	Prohibit private vehicles in village	Prohibit private vehicles in village during summer
Roads	Develop new road around village; encourage state to redesign M-109/209 intersection	No change	Realign M-209 around village; obliterate portion of Sleeping Bear Road	Develop major by-pass to lifesaving station

PROPOSAL	ALTERNATIVE 1 No Action	ALTERNATIVE 2 Extensive Interpretive Development	ALTERNATIVE 3 GMP Proposal
Village parking	Develop 40-car/4-bus parking area along new road	Use former dune ride parking area between cannery and D. H. Day store	Develop 225-vehicle parking near M-109/209 intersections; 20-car parking behind Inn.
Transportation system	Encourage county transportation system	No action	Provide shuttle system during summer
D. H. Day Campground	Redesign/upgrade (125 sites) and add group campsites	No action	Redesign/upgrade (125 sites) and add group campsites
Picnic area	Develop picnic area near beach use parking	Maintain small picnic area adjacent to cannery	Develop picnic area near shuttle parking area
Fish tug	Maintain next to cannery	No action	Relocate completely outside Glen Haven Village area

PROPOSAL	ALTERNATIVE 1 No Action	ALTERNATIVE 2 Extensive Interpretive Development	ALTERNATIVE 3 GMP Proposal
Trails	Develop trail system as in GMP with hiking trail on RR grade	Maintain existing trails	Develop trail system as in GMP
Dunes trailhead	Enlarge parking (10 cars)	Maintain near dunes	Relocate to Maritime Museum area
Beach use parking	Develop 10-car parking area between village and Coast Guard station	Continue use of existing parking area and village parking	Continue use of existing parking and new shuttle parking area
Maritime Museum (Coast Guard station) parking	No action	No action	Maintain existing 30-car parking area at Maritime Museum
Overlook	Develop overlooks at Quick property and near M-109 on Alligator Hill	No action	Develop overlook near Highway 109 only

TABLE 4: GLEN HAVEN DEVELOPMENT COST ESTIMATE

	PROPOSAL		ALTERNATIVE 2	ALTERNATIVE 3
Village Restoration		N/A		N/A
Village Restrooms	Adapt storehouse (340 SF) Utilities	34,000 50,000	Adapt Garage (816 SF)	New comfort station and storehouse
Roads	Village Road (1,700 LF)	170,000	Realign M-209 (1,700 LF) Obliterate 600 LF	Realign M-209 (4,400 LF)
Village Parking	40-car/4-bus	64,000	70-car/7-bus	210-car/15 bus 20-car/1 bus
Building Removal		9,000		
D.H. Day Campground	Redesign 125 sites (complete) Group campground Obliterate/revegetate New entrance station New dump station New amphitheater Campground subtotal	625,000 18,000 50,000 95,000 45,000 50,000 883,000	Add 35 sites New road (1500 LF) gravel Seal & Chip 1.5 miles Vault toilets (2) Extend water New amphitheater	Redesign 125 sites (complete) Group campground Obliterate/revegetate New entrance station New dump station New amphitheater
			25,000 38,000 60,000 40,000 20,000 50,000 223,000	625,000 18,000 50,000 95,000 45,000 50,000 883,000

PROPOSAL		ALTERNATIVE 2	ALTERNATIVE 3
Picnic area	5-site	4,000	20-site
Trails	Hiking trail (5 miles)	75,000	Hiking trail (2-miles)
	Accessible trail (2 miles)	148,000	Accessible trail
			Bicycle Trail
Dunes Trailhead	Add 10-car area	8,000	37,000
Beach Use Parking	Develop 10-car area	15,000	22,000
Overlooks	Parking (2-10) car Trail	30,000 10,000	Parking (10-car) Trail
GRAND TOTAL (NET)		<u>\$1,530,000</u>	<u>\$1,153,000</u>
		<u>\$2,234,000</u>	<u>\$1,683,000</u>
			<u>\$2,304,000</u>
			<u>\$3,364,000</u>

NOTE: Gross costs include 46 percent of net costs for design, construction supervision, and contingencies.

ALTERNATIVES

Alternatives to the proposal are discussed in this section. In each of the alternatives, as in the proposal, the access and building functions have been organized into a comprehensive package. However, the access and building functions could be combined differently if desired. For example, access from Alternative 1 could be combined with building functions from Alternative 3. For a summary comparing the proposal and alternatives, see Table 3 and 4.

ALTERNATIVE 1 - NO ACTION

In this alternative, no action would be taken to realign or otherwise improve existing roads in the area. Village parking would continue to be next to the cannery. Overflow parking would be permitted in a grassy area just south of the cannery that was formerly used for the dune ride operation (See Existing Conditions Maps).

The cannery would continue to be used as a boat museum. Visitors would take a self-guided tour of the village, obtaining interpretive information from a booklet or other literature. Vacant historic buildings would continue to receive exterior preservation only. As use and occupancy terms expire, the National Park Service would assume more maintenance responsibilities on the additional historic buildings.

The existing design and facilities of D. H. Day campground would be maintained. No action would be taken to relocate or modify the Sleeping Bear point trailhead, and no changes in the trail system would be made. No overlook would be developed.

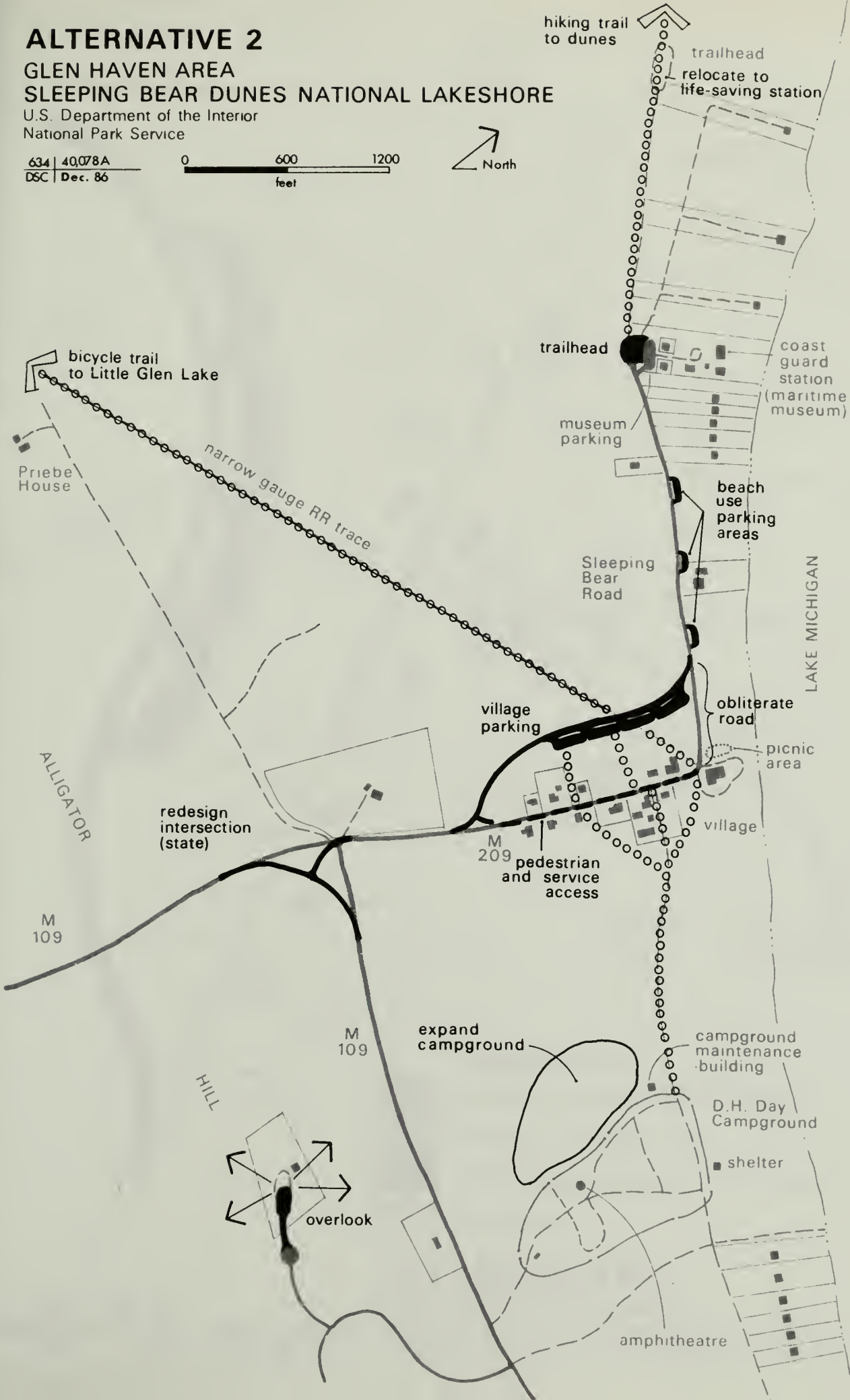
ALTERNATIVE 2 - EXTENSIVE INTERPRETIVE DEVELOPMENT

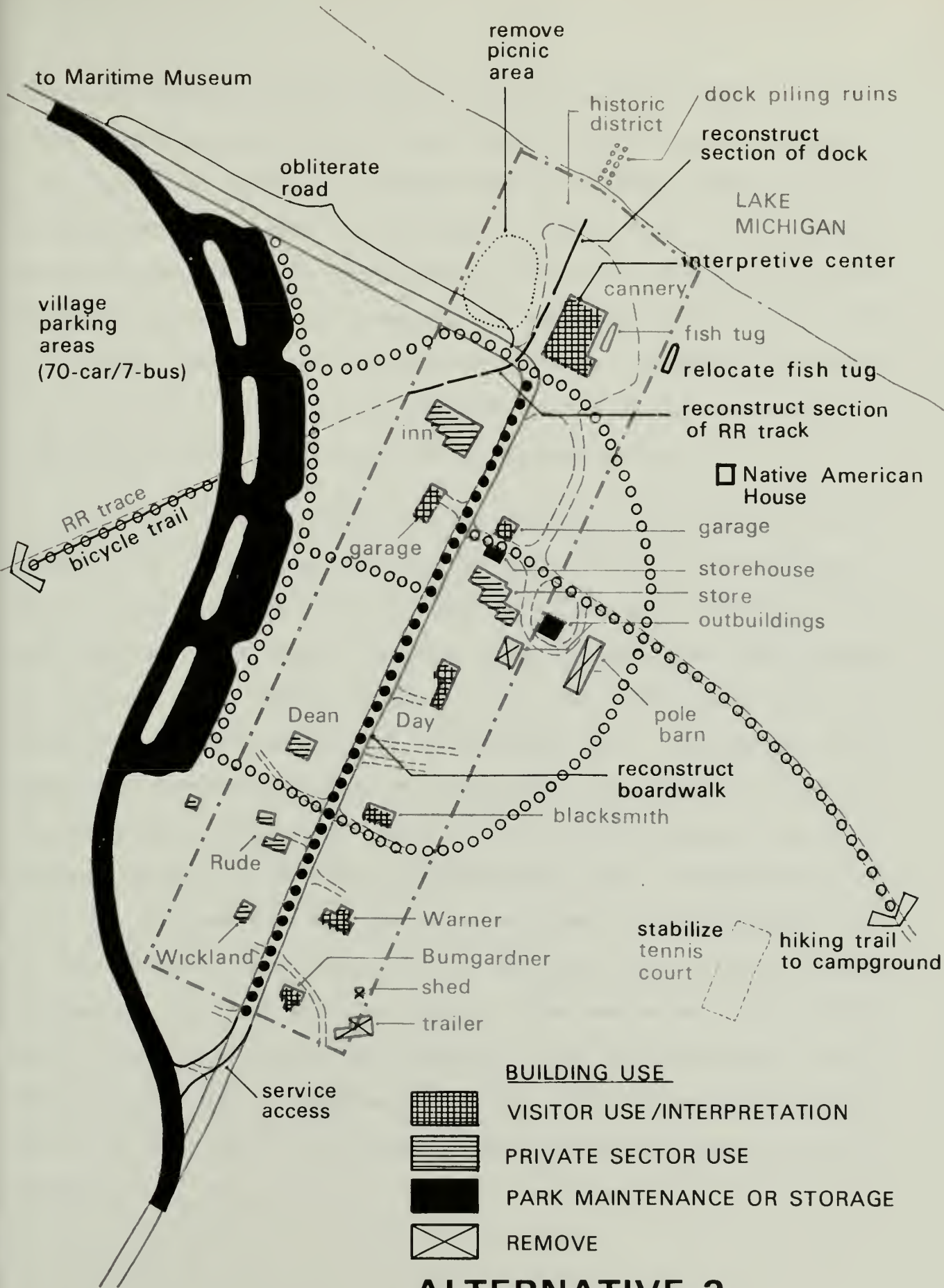
The concept of this alternative is to emphasize interpretive use and development in the village area, and to upgrade/redesign the D.H. Day Campground. The village would be restored to its 1920s appearance. As in the proposal, M-209 would be realigned to bypass the village. However, the stretch of Sleeping Bear Road from the cannery west approximately 600 feet would be obliterated (See Alternative 2 Maps). The abandoned portion of M-209 would be closed to visitor traffic, restored to its historic appearance and used for pedestrian circulation. It would only be open to emergency vehicles as needed, to service vehicles in off-hours, and to village residents. A larger series of parking areas, to accommodate approximately 75 vehicles total, would be developed adjacent to the new road west of the village. The greater capacity is needed because of the additional interpretive activities and increased length-of-stay that would likely occur in this alternative.

As stated above, the village would be restored to the 1920s. This was a period of transition for Glen Haven and other lakeshore communities. Glen Haven changed from a rustic lumber town to a painted and spruced-up resort community. Because of the extensive building and remodeling done in the 1920s, an older time period would require substantial alterations to the buildings. In the decade of the 1920s, buildings, equipment, and tools of its earlier logging and fishing industries would have been present around town. The fruit processing and steamship businesses would have been in progress, and future plans as a resort community would have been in preparation.

ALTERNATIVE 2
GLEN HAVEN AREA
SLEEPING BEAR DUNES NATIONAL LAKESHORE
U.S. Department of the Interior
National Park Service

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ALTERNATIVE 2 GLEN HAVEN VILLAGE

SLEEPING BEAR DUNES NATIONAL LAKESHORE
U.S. Department of the Interior / National Park Service

0 100 200
feet



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DSC | Dec. 86

Structure exteriors and the historic landscape would be restored to their 1920s appearance. In addition to restoring existing structures, a number of items related to logging and shipping that are no longer present would be reconstructed or replaced in the village. These include: (1) the narrow gauge railroad track; (2) one or two train cars as exhibits; (3) a short section of the dock near the cannery; (4) lumber stacks in the dock area; and (5) a Native American house illustrative of those once found in the area. The details of a restoration/reconstruction program would be developed in a comprehensive historic structure/cultural landscape report.

Overview interpretation, orientation, and restrooms would be provided at the cannery. The Sleeping Bear Inn would be privately used as in the proposal. The D. H. Day Store would be refurnished as a 1920s company store and could sell some items as historical souvenirs. The blacksmith shop would be used to interpret the logging industries, and the Warner house would be refurnished to interpret home life in the company town. The Bumgardner house would have exterior preservation only but could be interpreted by an exterior wayside exhibit. The garage south of the inn would house a series of interpretive exhibits describing the Glen Haven history. The garage north of D. H. Day Store would be used for public restrooms as in the proposal. One of the two small outbuildings east of the store would be used for park maintenance; the other would be removed. Other residences in the village would be used as private or park residences. The curling and tennis courts would be stabilized as interpretive exhibits. The fish tug would be moved about 100 feet east of the cannery just outside the historic district boundary.

The D.H. Day Campground would be expanded by approximately 35 sites to restore the capacity to about 125 sites, while retaining the site density at a lower level than the original state campground. This would be accomplished by adding a new loop or extending existing loops on the west side of the campground. The existing design would be retained with possible minor modifications to provide for circulation in accommodating the new loop(s). Water lines would be extended and vault toilets would be added to serve the new sites. An exhibit on the history of the campground would be developed at the historic shelter building and interior lighting would be improved. The Sleeping Bear Point trailhead would be relocated to the Maritime Museum area, and only the Quick overlook would be developed. Trails in the study area would be developed as proposed in the GMP, except that there would be no designated trail in the dunes area and no connection to Alligator Hill. Three small (5-car) beach use parking areas would be developed along Sleeping Bear Road between the village and lifesaving station.

ALTERNATIVE 3 - GENERAL MANAGEMENT PLAN PROPOSAL

This alternative is the most consistent with the concept identified in the 1979 GMP. As shown on the Alternative 3 maps M-209 would be realigned to the west and north, through the Ringl property, to connect with Sleeping Bear Road at the turnaround south of the Maritime Museum. There would also be a connection from the new M-209 to the old M-209 north of the Ringl property, creating a loop road. The abandoned section of M-209 would be obliterated.

Visitors would park at a large parking area (approximately 225 vehicles) southwest of the village. During the peak season, a shuttle would operate

ALTERNATIVE 3

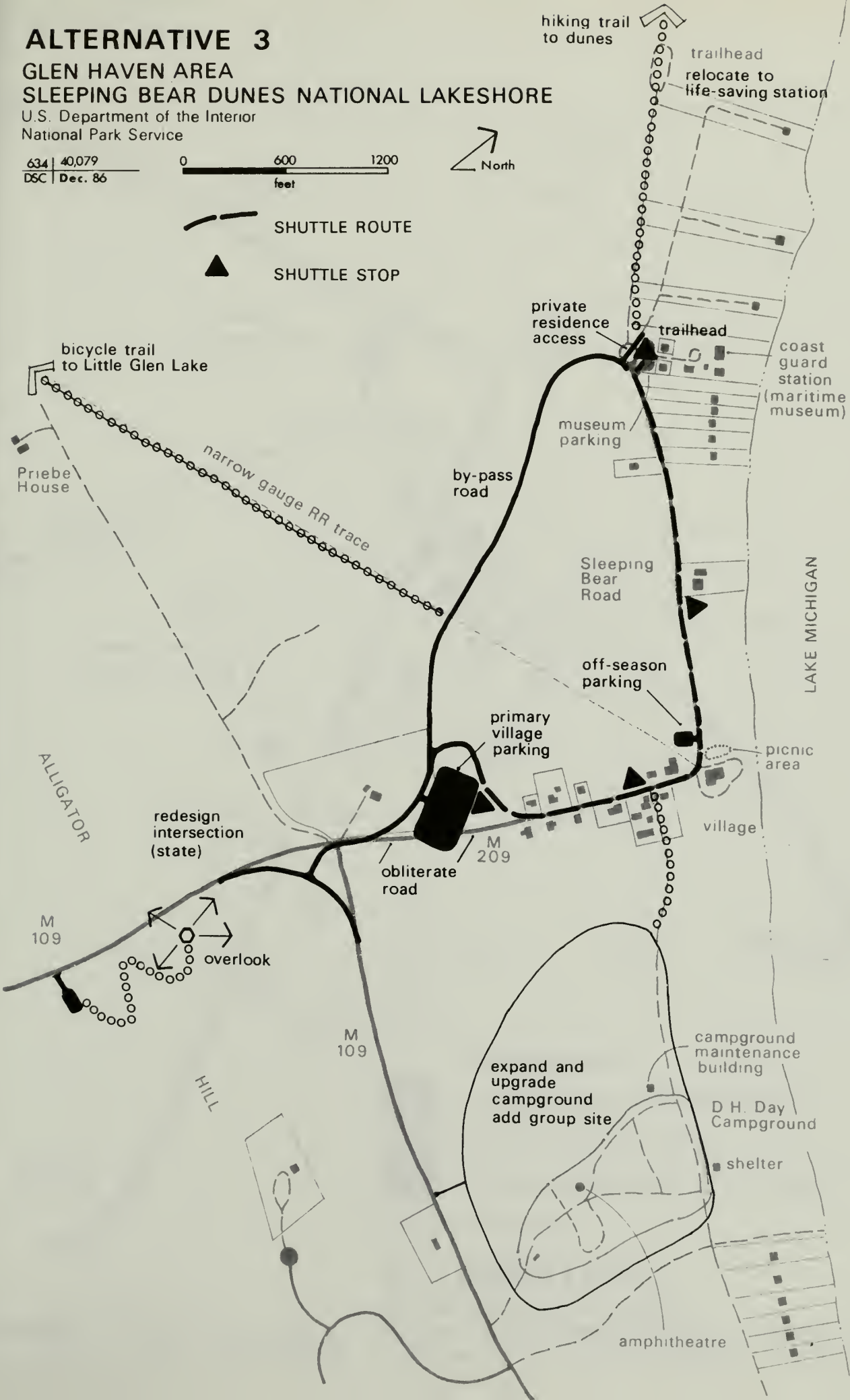
GLEN HAVEN AREA SLEEPING BEAR DUNES NATIONAL LAKESHORE

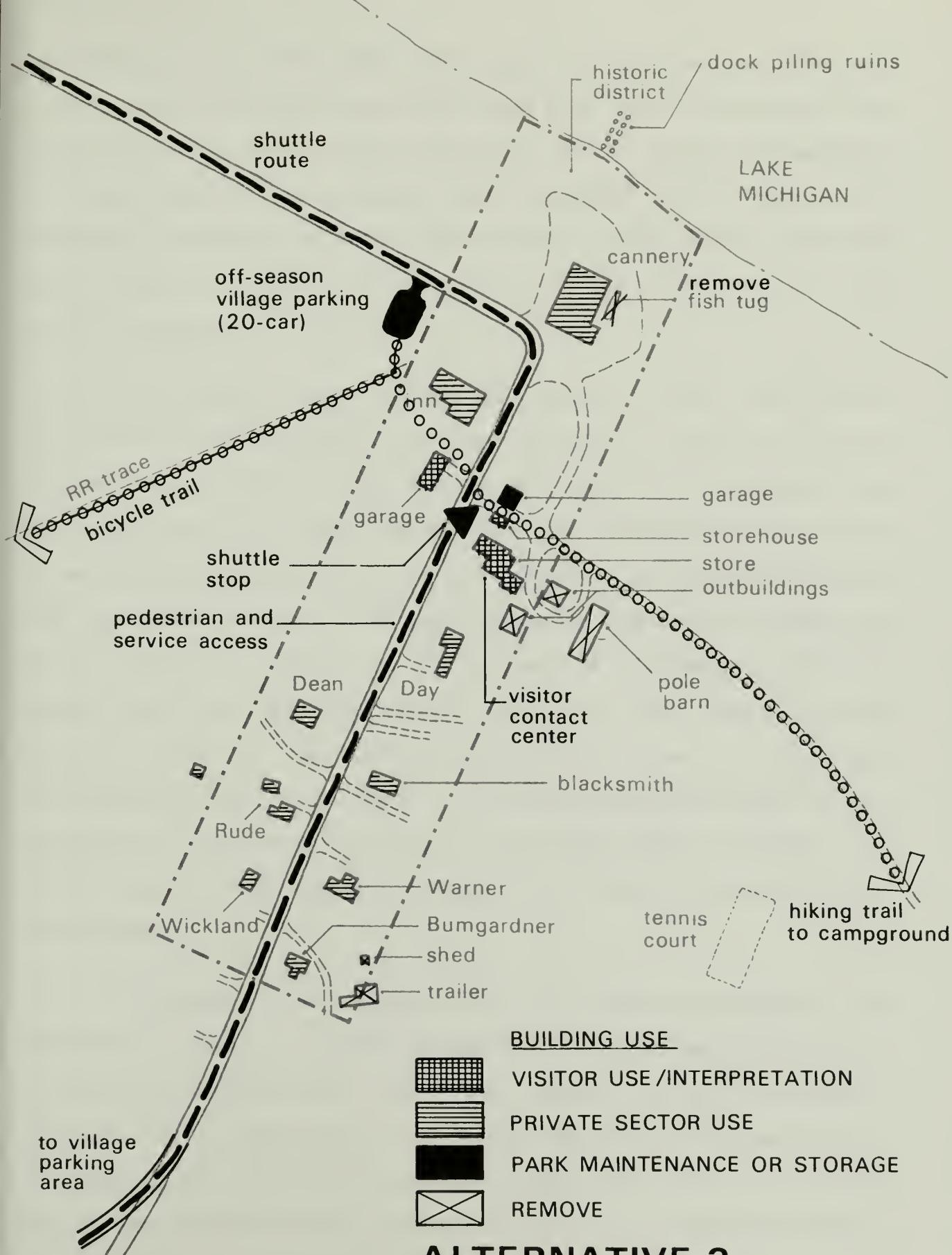
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National Park Service

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SHUTTLE ROUTE
SHUTTLE STOP





ALTERNATIVE 3 GLEN HAVEN VILLAGE

SLEEPING BEAR DUNES NATIONAL LAKESHORE
U.S. Department of the Interior / National Park Service

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with stops at the parking area, the village, the beach, and the lifesaving station. No visitor traffic would be allowed past the main parking area, but the road would be open to local residential traffic, service and emergency vehicles, as well as the shuttle. When the shuttle is not operating, the road would be open to visitor traffic, allowing visitors to park at the main parking area, in a small (20-car) parking area behind the inn, or at the Coast Guard Station, as they chose.

In order to provide a primary shuttle stop central to the village, general orientation to the area would be provided at the D. H. Day store. Overview interpretation of the Glen Haven story would be provided at the Sleeping Bear Inn garage across the street from the store. The Sleeping Bear Inn would be leased for private-sector uses, as in the proposal, but without the garage. The cannery would serve as a boat museum and would interpret the shipping and fishing industries. However, the fish tug would be relocated out of the Glen Haven Village area and placed somewhere else in the park. Public restrooms would be located at the main parking area and in the D. H. Day store storehouse (adjacent to the store). The store garage would be used for park maintenance; nonhistoric structures in the village would be removed. All other historic structures would be leased for private uses as discussed in the proposal.

As in the proposal, the campground would be extensively redesigned and upgraded. It would be expanded to provide 125 family campsites and group campsites for about 80 people. Paved roads, showers, and flush toilets would be added. As in Alternative 2, the Sleeping Bear Point trailhead would be relocated to the lifesaving station parking area, and the existing trailhead parking would be obliterated. Trails in the study area would be developed as

generally proposed in the GMP. An overlook was not located in the GMP. However, in this alternative an overlook would be developed at a site on the east side of M-109 where it cuts through Alligator Hill. A 10-car parking area and a D. H. Day Farm wayside exhibit would be developed, and a trail would be constructed up to an overlook on top of Alligator Hill that provides good views of Lake Michigan, Glen Haven, and the Little Glen Lake area. Some minor vista clearing of trees on the north slope of Alligator Hill would be needed to enhance the Glen Haven view. A wayside exhibit would interpret the historic landscape below.

ENVIRONMENTAL CONSEQUENCES

IMPACTS OF THE PROPOSAL

Natural Environment

Soils. A new septic system would be needed to serve the proposed public restrooms in the village. The leach field would be installed northeast of the D. H. Day store garage in the vicinity of the former dune ride parking lot. The soils and vegetation have been previously disturbed and the site is now a large open grassy area. Wastewater would be placed under the soil and nutrient values would increase. Where transpiration is high, substances in the wastewater would build up in the soil. Local buildups of soil moisture would cause water to occupy more intraparticulate space, affecting growth on the site.

Roads, parking areas, trails, and other impermeable surfaces would either wholly or partially eliminate direct water inflow to the soil. Soils would be compacted under these facilities, and site preparation (leveling) would result in either removal or addition of earth, destroying the soil structure. Topsoil would be stockpiled and reused following construction activities.

Imported topsoil would be used to supplement any shortage of native topsoil incurred in installing utilities or other facilities. This would minimize the overall loss of topsoil caused by development.

The impacted acreage figures for proposed parking lots and roads are summarized below:

<u>Development</u>	<u>Acreage</u>
new road (1700 feet)	1.3
village parking (40 car/4 bus)	.5
trailhead parking addition (10 car)	.25
beach use parking (10 car)	.25
campground redesign and upgrade	5.0
Quick property overlook parking (10 car)	.5
D.H. Day Farm Overlook parking (10 car)	.5

The redesign of the campground includes showers and flush toilets, which would require development of a sewage system. Placement of the expansion would be located to minimize impacts on the site.

Campground improvements and trail development and impacts would remain as proposed in the general management plan/environmental assessment (NPS 1979).

None of the land in the study area has been determined to be prime or unique farmland by the Soil Conservation Service.

Vegetation. Road, trail, and parking area construction would completely destroy existing vegetation. The exact location of these developments would be field sited to take advantage of natural vegetation to minimize impacts.

Increased nutrient values in soil beneath filter fields differ in effect, depending on concentrations of nutrients and the plant species present. Lower levels of nutrient enrichment generally promote plant growth, but increasing concentration progressively retards growth, or largely eliminates it, as the tolerance of each species to these chemicals is exceeded.

The precipitation that falls on building, roads, and other impervious structures would not be absorbed. To the maximum extent possible, water runoff from impervious structures would be directed to natural drainages, minimizing the impacts of increased moisture availability. In addition, the vegetation along road shoulders would be subject to crushing by vehicles.

Prior to installation of the septic system leach field and other facilities, the topsoil would be scraped off and set aside. It would be replaced and reseeded resulting in more rapid recovery of the site.

The expected increase in visitation and visitor foot traffic would cause some trampling of vegetation and soil compaction. The impacts of trampling would range from complete exclusion of vegetation to slight shifts in species composition.

Wildlife. Vegetative alterations due to construction activities would result in the displacement and destruction of resident invertebrates and small vertebrates. New facilities development would result in the displacement and disruption of small mammals and birds using the area.

Threatened and Endangered Species. Populations of the dune thistle or Pitcher's thistle (Cirsium pitcheri) are relatively common on the eastern shore of Lake Michigan, where glacial and post-glacial dune features provide suitable habitats. The thistle is found along the shoreline in the study area. The thistle should receive little if any impact from increased visitation since visitors to the beach tend to use the nonvegetated areas of the beach. The proposed beach parking area is located in an area that might at one time have been habitat for the thistle, however the site has been previously disturbed by residential construction. Potential damage to the

thistle through informal pathways from the road to the beach will be reduced with the development of beach parking and designated beach access trail.

The piping plover (Charadrius melodus) is the only endangered bird that has potential to be affected by visitor beach use. Presently the only known nesting site in the Glen Lake area is along the beach south of the Sleeping Bear trail. This portion of the shoreline is out of the study area for this DCP. However, park staff will continue to monitor the area for sightings and nesting sites of the piping plover.

Water Quality. Local impairment of surface water quality results from runoff contaminants (petroleum by-products, trash, etc.). This affect should be negligible overall.

Floodplains and Wetlands. None of the existing or proposed development is in the 100- or 500-year floodplain. Because the Glen Haven area is relatively protected and the shoreline slopes are gentle, wave runup should not cause significant problems. At present, lake levels are at all-time record highs and no problems have been experienced.

The proposal would not affect the three wetland areas included in the National Wetlands Inventory (1980) located in the pine-oak-aspen forest and transition zone between the Sleeping Bear Dunes and M-209.

Air Quality. Construction activities would temporarily increase the amount of particulates in the area. There would also be a temporary increase in noise levels. Increases in visitation and the number of cars would increase auto emissions.

Cultural Environment

Archeological Resources. There would be no affects on known prehistoric sites in the study area. There is some historic archeological material behind the inn that may be affected by road, parking, and trail construction. In conjunction with more detailed design and prior to any land-modifying activity, a qualified professional archeologist would inspect the proposed development sites and their immediate vicinity for the presence of cultural remains, both prehistoric and historic. Should newly discovered or previously unrecorded cultural remains be located, additional investigations would be accomplished prior to earth-disturbing activities. If significant remains were discovered, the development would be redesigned or a mitigation plan developed in consultation with the State Historic Preservation Officer. Similarly, in those areas where material is not discovered, but subsurface remains appear likely, a qualified professional would be on hand to monitor land-modifying actions.

Historic Resources. The exterior facades and historic landscapes would be preserved in the Glen Haven Historic District and at the Coast Guard station. Realigning M-209 around the village would remove modern vehicular traffic from the district enhancing the historic scene. The road would directly effect a small portion of the railroad trace, otherwise facilities are located outside the historic district. Portions of the new road and parking areas may be visible from the village during the off-season (when the trees are bare). Vegetation screening around the parking areas should reduce this intrusion somewhat.

Wayside exhibits and signs would introduce a nonhistoric element to the historic district, but they would be designed to be as unobtrusive as possible, and they would increase visitor understanding and appreciation for the area's historic resources.

Adaptive use, including private sector use, could result in significant modification to building interiors, depending on the use proposed. Private sector uses may reopen some buildings, such as the Sleeping Bear Inn and the D. H. Day Store, to public access. Some private sector use, such as residential use, would continue the current condition of no public access to building interiors. Occupied buildings would be better preserved than unoccupied structures, because of the regular maintenance and protection against vandalism they would receive. Increased visitor use could result in excessive wear and tear. However, conditions would be monitored and corrective measures taken to avoid significant deterioration.

Removing nonhistoric structures in the district would enhance the historic scene somewhat. Use of one structure for maintenance would continue the existing visual effects of that building; however, it is one of the less obtrusive of the existing nonhistoric buildings.

Preventive maintenance activities would be done to preserve historic structures. Selected paint colors would be appropriate to the historic scene.

Socioeconomic Environment

Regional Economy. Development of visitor services (lodging, food service, or a store) would positively impact the economy of the area surrounding Glen

Haven by creating service related jobs and the spinoff economic benefits of new businesses.

Visitor Use. Visitation to Glen Haven and the maritime museum would increase with the development of interpretation and service related facilities. The expanded capacity in the campground would allow the National Park Service to meet more of the substantial demand for camping in this popular area. The overlooks would provide an esthetic experience unavailable in the study area and increase interpretive understanding of the landscape. The proposed bypass would reduce pedestrian and vehicle conflicts experienced during the summer in the village area.

The portion of M-209 in the village would be converted to one-way traffic. This may be perceived as an inconvenience by visitors to the area who have traditionally been able to drive both ways through Glen Haven. Visitors would be inconvenienced by a short walk from the new parking area to the village; however, the overall experience in the village would be enhanced.

Crowding and congestion would occur at the maritime museum parking area as visitation increases. This may be relieved somewhat by the proposed beach use parking area that would be developed along Sleeping Bear Road.

IMPACTS OF ALTERNATIVE 1

Natural Environment

Soils. Village area parking would be allowed on the site of the former parking lot for the discontinued dune rides. The soil has previously been compacted and disturbed on this 0.5-acre site.

Vegetation. Use of the former parking area near the cannery would destroy the grass presently on the site. Continuation of beach parking along the road shoulder and subsequent informal paths to the beach could lead to crushing of vegetation.

Wildlife. No impact.

Threatened and Endangered Species. The effects would be the same as those listed in the proposal with the exception of the thistle. Parking along the shoulder of the road and the accompanying informal pathways could lead to crushing of vegetation, including the review species plant, Cirsium pitcheri.

Water Quality. No impact.

Floodplains and Wetlands. Same as proposal.

Air Quality. No impact.

Cultural Environment

Archeological Resources. Same as proposal.

Historic Resources. There would only be exterior preservation of village buildings. Continued deterioration would result from nonoccupancy in some of the buildings and the associated problems, such as vandalism, roof leaks, and lack of continual maintenance. The nonhistoric buildings would remain as intrusions in the historic district. The visual intrusion resulting from parking in the village would continue and increase as visitation grows.

Socioeconomic Resources

Regional Economy. No impact.

Visitation. The visitor experience in the village would continue to be very limited. Informal parking in the village would continue visitor confusion and inconvenience. Campers would continue to be turned away from the D. H. Day campground during the summer months because demand outstrips capacity.

IMPACTS OF ALTERNATIVE 2

Natural Environment

Soils. Except for the differences noted below, the impacts on soils are similar to those mentioned for the proposal.

The impacted acreage figures for proposed parking lots and roads are summarized below:

<u>Development</u>	<u>Acreage</u>
new road (1,700 feet)	1.3
village parking (70 car/7 bus)	1.5

maritime museum/trailhead parking (25 car/2 bus)	.5
beach use parking (3 5-car lots)	.7
campground expansion	1.0
overlook parking	.5

A new loop in the D. H. Day campground would require minor grading for road and campsite construction. The exact alignment of the road would be field located to take advantage of natural terrain and minimize impacts. The new water lines would be laid within the road corridor. The amphitheatre is small and its impact on soils and other resources would be negligible.

Vegetation. Same as proposal.

Wildlife. Same as proposal.

Threatened and Endangered Species. Same as proposal.

Floodplains and Wetlands. Same as proposal.

Air Quality. Same as proposal.

Cultural Environment

Archeological Resources. Same as proposal.

Historic Resources. Restoring and reconstructing the village buildings and landscape to a 1920s appearance would have a major effect on the existing historic scene. Modern fabric and materials would be removed. If accurate historic data is lacking, some conjecture may be needed to complete proposed restoration and reconstruction projects. Relocating the fish tug just outside the historic district boundary would remove the direct impact on the

district, but would make it even more visible from most points in the district.

Socioeconomic Resources

Regional Economy. Same as proposal.

Visitation. Same as proposal.

The interpretive and recreational opportunities available to the visitor would be greatly increased and improved. Interpretation of the 1920s era would be enhanced, but the post-1920s story would be down played.

IMPACTS OF ALTERNATIVE 3

Natural Environment

Soils. Except for the differences noted below, the impacts on soils are similar to those mentioned for the proposal.

The impacted acreage figures for proposed parking lots and roads are summarized below:

<u>Development</u>	<u>Acreage</u>
new road (5,100 feet)	4.0
225-vehicle parking lot	4.0
campground reconstruction	5.0
overlook parking	.5

The redesign of the campground would require expanded sewage services as discussed in the proposal. The roads would be realigned to allow for better circulation and paved to reduce dust problems from passing vehicles.

Vegetation. Except for the differences noted below, the impacts on vegetation are similar to those mentioned in the proposal.

Beach parking along the shoulder of the road would continue during the off-peak season when the shuttle system is not in operation. Subsequent informal

paths to the beach could lead to crushing of vegetation. Minimal clearing will be required for redesign of the campground and road construction. Exact locations will be field located to minimize impacts.

Wildlife. Same as proposal.

Threatened and Endangered. Same as Alternative 1.

Water Quality. Same as proposal.

Floodplains and Wetlands. The route of the bypass intersects a boggy area observed during a field reconnaissance in November, 1985. This boggy area may be the result of Lake Michigan being at a record high level. This area is not listed on available wetland inventory maps. The actual siting of the bypass route would take steps to mitigate the impact on this boggy area. Additional wetlands compliance documentation may be needed.

Air Quality. Same as proposal.

Cultural Environment

Archeological Resources. Same as proposal.

Historic Resources. Private use of buildings in the historic district would ensure continual maintenance on the buildings and prevent damage common to nonoccupancy associated problems, such as vandalism and roof leaks. The curling rink and tennis courts would be removed. These examples of recreation provided by the company for employees would be lost for interpretation to visitors. The lifesaving station residences would be removed and opportunity for interpreting the life of families of men stationed at the lifesaving station would be lost. Relocating the fish tug

outside the Glen Haven area would remove the impact completely from the historic district. However, the interpretive potential of tying Glen Haven to the commercial fishing theme would be reduced.

Visitor Use. Except for the differences noted below, the impacts on visitation are similar to the proposal. The shuttle system during the peak use summer months will remove vehicle and pedestrian conflicts in the village. The cost of the shuttle may be prohibitive to some visitors, discouraging use of the village and lifesaving station.

CONSULTATION

The National Park Service is consulting with several agencies and individuals during the preparation of this plan. The Park Service is undertaking informal consultation with the U. S. Fish and Wildlife Service regarding potential impacts on endangered species. The State Historic Preservation Officer and the Advisory Council on Historic Preservation about the effects on resources listed on the National Register of Historic Places. The Michigan Department of Transportation and the Leelanau County Road Commission will be consulted on the proposals that affect state and county roads. The DCP/EA will be distributed to appropriate agencies, organizations, and individuals for public review and comment. The document will also be available for review at park offices during the public comment period, and a press release will be issued to identify the document's availability.

SELECTED REFERENCES

U.S. Army Corps of Engineers

1977 Report on Great Lakes Open-Coast Flood Levels. (Prepared for Federal Insurance Administration). Detroit District, Detroit, Michigan.

1986 "Monthly Bulletin of Lake Levels for the Great Lakes," February. Detroit District, Detroit, Michigan.

Ayres, Lewis, Norris and May, Inc.

1978 "Design Report: Campground Improvements, Sleeping Bear Dunes National Lakeshore." Title 1 Report. Ann Arbor, Michigan.

Schlabach, Kathryn M.

1980 "Glen Haven: Options for Development" Thesis, Landscape Architecture Program, University of Michigan, Ann Arbor, Michigan.

U.S. Department of Housing and Urban Development/Federal Insurance Administration

1977 Flood Hazard Boundary Map. Township of Glen Arbor. Community Panel No. 260604 0003A, Page 3. Washington, D.C.

U.S. Department of the Interior/National Park Service

1978 Management Policies. Washington, D.C.

1979a Assessment of Alternatives. General Management Plan. Denver Service Center. Denver, Colorado.

1979b Sleeping Bear Dunes National Lakeshore General Management plan. Denver Service Center. Denver, Colorado

1979c "Interpretive Resource Base: Sleeping Bear Dunes National Lakeshore." Denver Service Center. Denver, Colorado

1983 Land Protection Plan: Sleeping Bear Dunes National Lakeshore, Frankfort, Michigan.

1983 Special Directive 83-3, Director, Washington, D.C., June 30, 1983.

1984 Draft Guidelines - Visitor Transportation Systems - Chief, Visitor Services Division, Washington, D.C., October 24, 1984.

1984 "D. H. Day's Kingdom" Special History Study by Ron Cornell, Midwest Regional Office, Omaha, NE.

- 1984 Environmental Assessment for a Docking Facility: Sleeping Bear Dunes National Lakeshore. Denver Service Center. Denver, Colorado.
- 1985 Cultural Resources Management Guideline. NPS-28, Release No. 3. Washington, D.C.

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APPENDIX A

VISITOR TRANSPORTATION SYSTEM FEASIBILITY

Glen Haven Area

Sleeping Bear Dunes National Lakeshore

February 1986

Maurice L. Miller

Denver Service Center

National Park Service

U.S. Department of the Interior

Introduction

The 1979 General Management Plan (GMP) for Sleeping Bear Dunes National lakeshore recommends that, to enhance the village atmosphere, private vehicles not be permitted in the Glen Haven area during the summer season. The GMP also states that a public transportation system may be provided in the area during the peak season for those who cannot walk or prefer not to. Assessing the transportation system's feasibility was determined to be necessary for development concept planning currently underway for the Glen Haven area.

This report analyzes the potential for this service in the immediate vicinity of the lifesaving station and the village as generally recommended in the GMP. It does not, however, address the feasibility or desirability of a larger system that might connect Glen Haven to other nearby attractions such as the Dune Climb and Stocking Scenic Drive.

Park Service Policy

The present policy of the National Park Service is to provide safe visitor transportation services within selected park areas wherever such systems are deemed a desirable alternative to the construction of additional roads, parking and support facilities in prime resource areas and where these services will improve park experience (NPS 1978). In facilitating use of park units via public transit systems, the National Park Service will work with Federal Agencies, states, local and regional planning bodies, citizen groups and others in developing and coordinating access to and within parks.

The National Park Service may develop, either through direct employment or by outside efforts, appropriate interpretation programs for use in conjunction with public transit systems within a park area. This service will be provided where such service can offer a genuine learning experience to people.

The National Park Service is to make all appropriate land transportation system and services, whether provided by the Service or by concessioners, accessible to and usable by physically disabled persons unless this action would alter the basic nature of the land transportation services. A sufficient percentage of the vehicles should be wheelchair accessible. Until this goal is realized, a separate accessible vehicle will be provided or a disabled person will be allowed to drive his or her personal vehicle on otherwise restricted roadways. No new roads will be developed for the sole purpose of providing disabled visitor access. Accessibility will also be provided in water transportation systems.

NPS Guidelines

Present draft guidelines of the National Park Service (NPS 1984) pertaining to establishment of a visitor transportation system (VTS) in an NPS unit involves two basic items (funding and criteria for implementing a VTS).

Insofar as possible a new VTS should be self supporting and operated at no cost to the federal government; private sector should own and operate the system. Some existing systems are funded by user fees, increases in visitor rates for a variety of goods and services by a concessioner and by annual

appropriations. In some instances, a combination of user fees and annual appropriations are used simultaneously.

The basic criterion for considering a new system is resource protection. A VTS would be an alternative to correct a serious traffic congestion and safety problem where road improvements and/or parking facility construction would have serious impacts on the resources.

Secondly, a VTS should also (1) have a visitor demand that warrants operating a system, (2) have a minimum passenger load factor of approximately 50 percent or more (3) require less energy than private vehicles providing the same transportation task and (4) operate economically.

Lakeshore Visitation High Use Months

Table 1 shows high use month recreation visits to Sleeping Bear Dunes National Lakeshore and the Glen Haven Coast Guard Station.

TABLE 1
Recreation Visits

Month	Total Lakeshore Visits Average 1977-85	% of Aug. Visits	Coast Guard Station Visits Average FY 84-85	% of Aug. Visits ¹	% of August Visits for Forecasts
June	85,028	35.0	1,377	31.3	34
July	242,342	99.8	3,198	92.7	96

August ¹	242,906	100.0	9,403	100.0	100
September	77,293	31.8	10,148	34.1	32

¹ Maximum Use Month

The monthly trends identify that August is the highest use month closely followed by July for the lakeshore as well as the Maritime Museum in the lifesaving station. Based on historical traffic data, lakeshore visitation data, and studies by the Statistical Office of the Denver Service Center, it is estimated that the Glen Haven area recorded approximately 1000 visits per day during August 1985. This includes visits to the Maritime Museum, the Dunes trailhead near the museum, and the Glen Haven Village and beach area.

Potential Visitor Transportation System Ridership

The average daily visitation figures for August and other high use months include all of the visitation occurring over that particular month including high-use visitation days (weekends and holidays) and some days with lower visitation than the average day for the month. In arriving at a number or numbers of potential bus passengers, average day loadings are most important for projecting the number of passenger loadings by month and consequently the total for an operating season.

It may not be practical or feasible to accommodate potential loadings on a peak day (highest use day of season or month) but it may be realistic and necessary to transport most of the potential passengers on high-use days. Based on information from lakeshore staff, weekend days recorded 10 to 20

percent greater visitation levels than on weekdays during the summer. In determining projection factors for potential bus loadings, it was presumed that high-use days would record a level of activity 15 percent higher than on average use days. Table 2 shows estimated average and high-use day passenger loadings by month for maximum potential loadings. For comparative purposes 1985 loads were estimated along with 1995 and 2005 loads. A system, if implemented, would probably not be operative until 1995 or at least until visitor facilities are opened in the village.

It is presumed that 100 percent of the visitors would not use a visitor transportation system. Visitors might not use the system if fees were charged to use the system even if private vehicles are prohibited for using the transit route. It is presumed that private vehicles would not be permitted on M-209 in the village and the road to the lifesaving station if a system was in operation. Visitors might also choose to walk into the village area rather than ride a transit vehicle because walking distance does not exceed 1/2 mile one-way.

TABLE 2

Average and High Use Day Passenger Estimates

Glen Haven Area Maximum Loads

Month	Use as a % of August	Avg. day Visitation 1985	Avg. day Loading 1985 ¹	High Use Day Loadings 1985 ²	Avg. day Loadings 1995 ¹	High Use Day Loadings 1995 ²	Avg. day Loadings 2005 ¹	High Use Day Loadings 2005 ²
June	34	340	305	350	375	430	550	635
July	96	960	865	995	1055	1215	1550	1785
August	100	1000	900	1035	1100	1265	1620	1865
September	32	320	290	335	350	405	520	600

¹ 90% of visitation - presumes that some visitors will walk instead of ride a visitor transportation vehicle and no fee is charged for ridership.

² 1.15 X average day use

NOTE: Overall lakeshore visitation projected to increase by slightly more than 1% per year - Glen Haven area (Village and beach, lifesaving station and trailhead area) visitation projected to increase by 2% per year or 22% between 1985 and 1995 amounting to 1220 in 1995 and 4% per year or 47.5% between 1995 and 2005 amounting to 1800 in 2005.

The maximum potential loadings in Table 2, amounting to 90 percent of projected total visitation, presumes that transportation would be free to the user and that some would walk to the village.

Due to the uncertainties of funding a system and factors noted above, estimates at 60 percent of total projected visitation levels were developed as shown in Table 3.

Operating Season and Vehicle Type

It was estimated that visitor transportation services would be available during the high use months in the summer amounting to 81 days (15 in June, 31 in July, 31 in August and 4 in September). It appears that an open air shuttle/tram or light transit bus would be the most appropriate vehicles for transporting visitors in the Glen Haven Area. Due to the short distances between stops, a transportation vehicle would be travelling at relatively low speeds. Low travelling speeds and summer operation permit the use of an open air tram type of vehicle.

One of the prominent builders of the tram type of vehicle is Chance Manufacturing Company, Inc. The company constructs a power unit capable of pulling three coaches with articulated four-wheel steering. The capacity of the power unit is 21 passengers and each coach can carry 28 passengers. The system provides flexibility in passenger capacity due to increasing or decreasing the number of trailing units depending upon demand. Available options include a public address system, wheelchair accessibility, special paint schemes and others based on the users' needs.

TABLE 3

Average and High Use Day Passenger Estimates
Less Than Maximum Loads

Month	Use as a % of August	Avg. Day Loadings 1985 ¹	High Use Day Loadings 1985 ²	Avg. Day Loadings 1995 ¹	High Use Day Loadings 1995 ²	Avg. Day Loadings 2005 ¹	High Use Day Loadings 2005 ²
June	34	205	235	250	290	365	420
July	96	575	660	700	805	1035	1190
August	100	600	690	730	840	1080	1240
September	32	190	220	235	270	345	390
1 60% of visitation forecasts							
2 1.15 x average day use							

Electric, battery-powered buses would be environmentally ideal. They consume no fossil fuels, are essentially pollution free, and operate very quietly. However, several disadvantages currently outweigh these positive characteristics. These vehicles have not yet been proven in a rigorous bus operation and they are extremely expensive compared to more standard vehicles. Studies have shown there are no savings in total operating and maintenance costs. Regular maintenance requires that the battery units must be changed and charged after approximately four hours of operation.

Converted vans, light transit vehicles, small modified school buses and light buses could be considered for use at Glen Haven. They do not provide the flexibility in passenger capacity as the tram with a power unit and one or more trailing units. However, capital and operating costs are lower for these types of vehicles than for the tram system.

For forecasting purposes, a tram unit with a power unit and one or two trailing coaches and a light transit vehicle/bus were analyzed for potential service at Glen Haven.

Route Mileage and Stops

The visitor transportation vehicle would start at the parking lot south of the village, go through the village, proceed northwest to the lifesaving station, and return to the parking lot south of the village along the same route. This roundtrip would be 2 miles in length with stops at approximately 4 points for loading and unloading. For forecasting total travel and running time, it was estimated that the transit vehicle would load and unload at the

parking lot/staging area south of the village, stop at the store, stop at a point west of the village for those destined for the beach, and load/unload at the lifesaving station. Based on these presumptions, total stop time would amount to approximately 8 to 9 minutes and running time would amount to about 11 minutes for a total trip time of 20 minutes. The average travelling or running speed would amount to 11 miles per hour.

It would be desirable to maintain passenger schedules every 10 minutes to encourage use through convenience and flexibility. One vehicle could make 3 trips per hour with 10 minute headways. It would take 2 vehicles moving at all times to provide 10 minute headways or 6 trips per hour. The system could start operating at 9:00 or 9:30 am and end service around 5:00 to 5:30 pm. This schedule would depend upon visitor patterns at Glen Haven. For forecasting purposes, the system was estimated to be in operation 8 hours per day.

When passenger demand would exceed the capacity of scheduled vehicle trips, additional vehicles could be added at a scheduled departure time or in between departures to shorten headways (i.e., 1 bus every 5 minutes, etc.) This factor was included in the forecast analysis.

Capital and Operating Costs

As indicated previously, two types of vehicles were used in the forecast analysis. The costs for each of the types of vehicles were estimated as follows.

Tram System:

1. One power unit - \$55,000 capital costs - \$9,421 annualized capital costs (vehicle life 10 years, 12% interest rate, 10% salvage value) - \$1.45 per mile operating costs.

2. One power unit and one trailing coach - \$79,800 capital costs - \$13,669 annualized capital costs (vehicle life 10 years, 12% interest rate, 10% salvage value). \$1.65 per mile operating costs.

25-Passenger Bus: \$49,000 capital costs - \$8,393 annualized capital costs (vehicle life 10 years, 12% interest rate, 10% salvage value). \$1.10 per mile operating costs.

The capital costs and annualized capital costs do not include costs for ancillary support facilities such as parking/staging areas, bus shelters (if desired), and comfort stations.

Driver's wages were estimated at \$11.25 per hour including fringe benefits. Costs were estimated for total hours but did not include costs for overtime wages if required.

Total annualized costs included capital and operating costs of equipment (not replacement costs), personnel costs, and 20 percent added to operating and maintenance costs. This latter item included costs for overhead and/or profit, administration, and contingencies.

Annualized Cost Implications

These data, presumptions and forecasts were analyzed to arrive at comparative potential vehicle loadings and costs. Table 4 shows the results of these analyses. The table shows the number of passengers, number of trips, miles travelled, vehicle operator time, number of vehicles required for both average and high use days, total annualized costs, and cost per user for each option. The number of additional buses and trips per day for high use day use was added to the costs where applicable. In each option, one standby vehicle was included in the costs due to need for emergency repairs.

The maximum load options presume that 90 percent of the private vehicular drivers and passengers would use the visitor transportation system. For all practical purposes this level of use would not be attained particularly if a user fee was charged for ridership. Less than maximum load options presume that 60 percent of the visitors would use the visitor transportation system.

All headways or schedules between buses amounted to 10 minutes except as noted in the table. Twenty minute headways were used in several of the options. Due to headway requirements of 10 minutes, two vehicles were needed at all times because each trip is estimated to take 20 minutes for a round trip. Consequently, all options included 3 units (2 for use - 1 standby) or more. As mentioned earlier, the 21-passenger vehicle is a tram power unit and one trailer and the 25 passenger vehicle is a 25-passenger light transit vehicle/bus.

As noted in Table 4, the highest passenger loadings result in lower costs per rider. The lowest cost per user amounted to \$.71 using the maximum passenger loadings projected for 2005 ranging to \$1.41 for less than the maximum loads for 1985. Generally, the tram system results in higher costs due to higher capital and operating costs until higher passenger loads would require a trailer unit or units with the power unit. The large difference in annualized costs between the 21-passenger tram power unit unit and the 25-passenger bus with the 1985 maximum passenger load option reflects not only higher capital and operating costs of the tram unit but the requirements of adding one more power unit because the 21-passenger capacity of 2 power units would not meet the high use day loadings.

As noted in the 1985 and 1995 loading options, reducing the headways in June and September would result in some cost savings. Passenger loadings would be much less in these two months than in July and August. However, flexibility and convenience in ridership is decreased with longer headways.

The use of a tram with the 2005 projected loads would result in lower costs due to the flexibility in carrying a higher number of passengers per trip. A second and third trailer can be added to the power units to additionally increase capacity per trip if demand would warrant higher loadings.

Presuming that the user would have to pay the costs of operating a system and that passenger loadings would be near 50,000 per season (60 percent of present visitation or 72 to 73 percent of projected 1995 visitation), the cost per user is estimated at approximately \$1.15 (1995 less than maximum load - 25-passenger bus option). The costs per user probably should be

spread among children and adults. Presuming that 1 of 4 riders is 12 years old or younger and that user fees would be lower for children, a fee schedule might be arrived at as follows:

- Presume - 49,000 passengers
- \$56,599 annual costs
- Average cost per user = \$1.15 for 1 round trip
- Charge \$.50 for children ($$.50 \times 25 \times 49,020$) = \$6,128 to be paid for children riders
- $\$56,599 - \$6,128 = \$50,471$ to be paid by adult riders
- $\$50,471 \div 36,765$ (adult riders) = \$1.37 (round to \$1.40)

If the user had to totally pay for the trip, adult ticket prices would be \$1.40 per person and children tickets would be \$.50. The costs could be higher with lower ridership levels and/or if specific support facilities were added to the user costs (i.e., parking/staging area, shelters, comfort stations). Replacement of new vehicles at the end of the service life of existing vehicles (10-years) was not included at a future year at higher capital costs. Amortization of costs of first purchase of new vehicles was included. Overtime wages for drivers were not included, but all operating hours of drivers were included.

Based on the operational aspects of the system projected in this report, it appears that the cost per user would be over \$1.00 per person and probably closer to \$1.50 per person if a fee system is used to pay for the total system.

It appears that \$1.50 per rider might be an excessive fee for the total experience gained by the visitor in the Glen Haven Area and might discourage use of the area when the shuttle is in operation. Glen Haven Village would be in close proximity to the parking/staging area and visible from the parking area. A user fee would encourage visitors to walk to the village rather than take the shuttle. Consequently ridership levels would be lower and the cost per user higher.

Costs might be saved if used vehicles were utilized or if a system presently operating with the county could be expanded/used in the Glen Haven Area. An example of this is the leasing of school buses from a school district during the summer months for use in Rocky Mountain National Park.

Costs also could be higher than projected due to greatly increasing insurance rates for liability. Also, if an operator had to purchase new vehicles for use only 81 days per year, and they were unused the remainder of year, the profit potential would be low viewing it on an annual basis.

Parking/Staging Area Needs

If all visitor parking is located south of the village during shuttle operation hours, the total parking time consists of time spent at the village, beach, lifesaving station and the Dune trail plus the time riding on the shuttle. Parking needs are shown in Table 5 based on the high use day maximum passenger loadings for 1985, 1995, and 2005 for parking a duration of 2 hours, 2 hours and 30 minutes, and 3 hours plus 20 minutes for a round trip on the shuttle.

TABLE 5

High Use Day
Parking Needs Village Parking Lot
with Shuttle Service
Maximum Loads

	No. of Visitors Projected to Ride Shuttle	No. of Visitors per Hour ¹	No. of Vehicles per Hour ²	Parking Demand 2 hrs 20 mins.	Parking Demand 2 hrs 50 mins.	Parking Demand 3 hrs 20 mins.
1985	1035	135	41	96	116	135
1995	1265	165	50	117	142	165
2005	1865	250	78	182	221	257

$$1 \quad \frac{1035}{8} = 129 \text{ (used 135)} \quad \frac{1265}{8} = 158 \text{ (used 165)} = 233 \text{ (used 250)} - \text{used}$$

slightly higher figures for the higher use hours during the day;
parking would not be evenly spaced over an 8 hour day.

2 No. of Visitors 3.3

NOTE: In using the less than maximum loads forecasts, the parking demands would be approximately 66 percent of the demands in this table.

The use of a central parking/staging area would require one single lot larger in size than individual lots serving each of the use areas in Glen Haven.

Using a parking duration figure of 3 hours and the maximum load option range, parking demand would range from 135 to 257 spaces depending upon passenger loading. If the Less than Maximum Load Forecast for 1995 (49,000 passengers) is used as in the example for estimating adult and children fares, a central parking/staging area of 110 spaces (.66 x 165) would be required for transit riders. However, some spaces would be required for visitors not riding the system. Under this option, the parking/staging area would probably require spaces for 130 to 140 vehicles.

A parking area containing 257 spaces would require 3.0 to 4.0 acres depending upon landscaping and the percentage of oversize spaces.

Visitor transportation system vehicles would require space to be stored near the Glen Haven Area. Routine maintenance and repair space would also be required relatively near the area.

Conclusions

1. It was difficult to forecast visitation and potential passenger loadings for the Glen Haven area due to the limited amount of visitor use data for the total area (Glen Haven Village, beach, lifesaving station and dune trail area near the station) and the undeveloped nature of the village at this time.

2. If user fees were charged for riding the system, visitors might choose to walk to the village from a nearby parking/staging area due to the relatively short walking distance of less than 1/2 mile one-way. The transit trip is not one of going from the parking/staging area to one destination point but rather to dispersed points along the route. A free use system would attract more ridership even for the short segments of the trip.

3. Total annualized costs to operate the system would range from \$53,648 to \$90,352, and the cost per user would range from \$.71 to \$1.41 using new vehicles. With a passenger loading of near 50,000 per season, a fee structure of \$1.50 for adults and \$.50 for children is estimated to cover system costs. If ridership would be lower, costs per rider would be higher. Costs might be lower if used equipment willutilized or if equipment were leased through a local transit company or school district. However, in this instance the vehicles might not meet the operational needs of the Park Service.

4. Due to greatly increasing insurance rates for liability, the uncertainties concerning ridership levels, the dispersed nature of visitor destinations in the area, and the present lack of visitor activities in the village, it appears that a visitor transportation system is not presently economically feasible nor will it be for perhaps up to a period of 10 years. In the long term, 15 to 20 years, with full adaptive use of the village, ridership levels might be at a level to sustain the system if it had to cover costs. If the draft development concept plan were implemented the proposed village bypass and parking areas would still be used by private vehicles during the season when the transit system is not in operation. A new

staging/parking area would be required at the south edge of the village. The proposed development concept plan would not preclude this action.

5. A single parking/staging area at the south edge of the village would require a higher number of parking spaces than the total for the dispersed lots because all of the visitor duration/stay time is concentrated at one location rather than 3 or 4 lots, and parking duration time must include the time for riding on the system.

